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ADAPTATION OF GAUSSIAN PLUME MODEL TO INCORPORATE MULTIPLE STATION DATA INPUT.

VOLUME II. APPENDICES

ENVIRONMENTAL RESEARCH AND TECHNOLOGY, INCORPORATED

PREPARED FOR
ENVIRONMENTAL PROTECTION AGENCY

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EPA urban dispersion models were modified to consider multiple station information on wind speed and direction. Three models were modified: the Real-Time Air-Quality-Simulation Model (RAM) and the Sampled-Chronological Input Model (SCIM), both short-term averaging models, and the Climatological Dispersion Model (CDM), a long term averaging model. Relatively straight forward modifications, which are useful and practical approximations have been made. The modifications had two basic objectives: the first, to develop techniques for describing wind conditions at any point within a region in which arbitrarily-located observing points exist; and second, to identify critical points in the dispersion algorithms at which the additional multiple-station wind data could be incorporated and to modify these computation routines accordingly. The modifications were compared among themselves on the basis of accuracy, computational efficiency and ease of use. Although no observational data was available to verify the various approaches, the results of applications to hypothetical meteorological situations indicate that more realistic results can be obtained by the incorporation of multiple-station data.

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APPENDIX A

USER'S GUIDE TO RAM MODIFICATIONS

A.1 DESCRIPTION OF INPUT TO RAM

A.2 FORTRAN IV PROGRAM LISTING

A.3 TEST CASE

(TO BE USED AS APPENDIX C IN RAM USER'S MANUAL)

A.1 DESCRIPTION OF INPUT TO RAM

A.1.1 Disk File Input

RAM requires that the source data be preprocessed using RAMP and, thus, the source data may be read from unit 9 in the same unformatted sequence as it was written by RAMP.

A.1.2 Card Input

The various input routines required by the multi meteorological station capability and the usual RAM processing are initiated by means of "keyword package" cards. These include the following:

A.1.2.1 PARAMETERS

Allows the modification of program parameters or run options. Parameters or option variables are set to default values at compile time and, hence, only those which are to be modified need be entered. The format of the data package itself is a Fortran IV namelist with the name &INGRID.

The specific method used is selected through combinations of the parameters LTHETA, THETA, FACT, NOFACT, POWER and RADIUS.

1) Inverse distance power law: Set THETA to 360. and POWER to desired value. All other parameters are allowed to assume default values.

2) Selective Angle Method: Set THETA and POWER to default or desired values. Other parameters assume default values.

3) Selective Radius Method: Select non-zero RADIUS value, THETA = .FALSE., and POWER. The other parameters may assume default values.

4) Weighting Factor Matrix: Set NOFACT = .FALSE. and specify weighting factor array, FACT, according to format below. This method must be used in conjunction with one of the three methods above.

The format of a 'PARAMETERS' package is

FIRST CARD

Columns	Contents	Format	Description
1-10	'PARAMETERS'		
21-70	TITLE	12A4, A2	Run heading for printing

SECOND CARD

Columns	Contents	Format	Description
2-8	'&INGRID'		

FOLLOWING CARDS

Columns	Contents	Format	Description
2-80			Parameters to be initialized by FORTRAN Namelist &INGRID; these parameters are:

Name	Type	Dimension	Default	Description
ORIGIN	R*4	2	(0.,0.)	Origin of the weighting grid system
NX	I*4	-	1	Number of cells of the weighting grid system (X direction)
NY	I*4	-	1	Number of cells of the weighting grid system (Y direction)
GX	R*4	-	1.0	The east-west dimension of each cell of the weighting grid
GY	R*4	-	1.0	The north-south dimension of each cell of the weighting grid
THETA	R*4	-	45.0	The search angle used in determining the wind direction and wind speed at a location

FACT	R*4	50,10,10	5000*1.0	The weighting factors utilized in determining the wind direction and wind speed at a location
NØFACT	L*4	-	.TRUE.	.TRUE. if no weighting factors are specified
LTHETA	L*4	-	.TRUE.	.TRUE. if search angle used
POWER	R*4	-	2.0	Power law for inverse distance weighting
RADIUS	R*4	-	1.0	Radius for selective radius method.

LAST CARD

Columns	Contents	Format	Description
2-5	'&END'		

A.1.2.2 STATIONS

This "keyword card" initiates the reading of the station locations (user units) and heights (meters). Up to 50 station locations are allowed. If either more than 50 station locations are specified or the station locations are out of sequence, an error message is issued and the job is terminated.

FIRST CARD

Columns	Contents	Format	Description
1-8	'STATIONS'		
21-70	TITLE	12A4,A2	Run heading for printing

FOLLOWING CARDS

Columns	Variable	Format	Description
6-10	NO	I5	Station identification number
11-20	X	E10.0	Station east-west coordinate (user units)

21-30	Y	E10.0	Station north-south coordinate (user units)
31-40	Z	E10.0	Station height (meters)
41-70	STAID	7A4,A2	Optional 30 character station name which is used for printing only

LAST CARD

Columns	Contents	Format	Description
1-5	'99999'		Delimiter card

Multi-station mode (internal variable MULTI=.TRUE.) is indicated if more than one station location is specified.

A.1.2.3 WEIGHTS

This "keyword card" initiates the reading of the weighting factors which are subsequently used in computing the wind direction and wind speed at a specific location. These factors are specified on a grid cell by grid cell basis, i.e., from each of the -up to 50-previously specified stations to each of the -up to 100 (10 x 10) - grid cells. Only those factors which are not 1.0 should be specified since 1.0 is the default value of all of the weighting factors.

FIRST CARD

Columns	Contents	Format	Description
1-7	'WEIGHTS'		
21-70	TITLE	12A4,A2	Run heading for printing

FOLLOWING CARDS

Columns	Variable	Format	Description
6-10	NO	I5	Station identification number

11-15	IX	I5	Horizontal (row) grid cell number
16-20	IY	I5	Vertical (column) grid cell number
21-30	FIELD	E10.0	Station-to-grid cell weight (normally between 0. and 1.)

LAST CARD

Columns	Contents	Format	Description
1-5	'99999'		Delimiter card

Non-unity weighting factors would normally be used to incorporate the knowledge of the representativeness of data as affected by topographic features such as hills and valleys. Moreover, they may also be used to express the confidence one has in the validity of a station's measurements. For example, if in a group of stations there existed only one National Weather Service station, this station would, on a grid cell basis, be assigned a value of, perhaps, 2.0, whereas the remainder of the stations would be assigned a value of 0.5.

A.1.2.4 RAM

This "keyword card" initiates the calling of subroutine RAM (formerly, the main program) and, therefore, from this point, the program flow and related input proceed as before.

FIRST CARD

Columns	Contents	Format	Description
13	'RAM'		
18-20	NMAX	I3	Number of iterations used in computing travel distance
21-70	TITLE	12A4,A2	Run heading for printing

Any changes to the input are directly related to the meteorology which must be specified for the multi-station cases; for clarity, all of the input requirements will be restated and the modifications will be shown wherever needed:

Columns	Format	Variable	Comments
Card Type 1:	Program Options and Parameters		
1	I1	IOPT(1)	Point Source Data
2	I1	IOPT(2)	Area Source Data
3	I1	IOPT(3)	Permanent Receptors
4	I1	IOPT(4)	Significant Point Receptors
5	I1	IOPT(5)	Significant Area Receptors
6	I1	IOPT(6)	Honeycomb Receptors
7	I1	IOPT(7)	Hourly Output
8	I1	IOPT(8)	Partial Concentration Written Disk
9	I1	IOPT(9)	Print Only Summary Hourly Output
10	I1	IOPT(10)	Punch Cards for Contours
11-20	F10.2	Z	Receptor Height (m)
21-30	F10.2	TLIM	Time Limit on Integration
31-40	F10.3	FH	Fraction of Area Source Height Which is Physical Height
41	I1	NHTS	Number of Height Classes (Max 3)

Note: Options should be codes as follows:

0 - option will <u>not</u> be used

1 - option will be used

The time limit on the integration, TLIM, is calculated by dividing the farthest possible distance (in meters) from any receptor to a border of the area source grid by the minimum wind speed (m sec^{-1}) which will be encountered.

Columns	Format	Variable	Comments
Card Type 2: Program Parameters.			
1-5	I5	NHOURS	Number of Hours for Simulation
6-10	I5	NSIGP	Number of Significant Point Sources (Max. 25)
11-15	I5	NSIGA	Number of Significant Area Sources (Max. 10)
21-30	F10.3	GRIDSP	Spacing for Honeycomb Receptor (user units)
31-40	F10.3	BPH(1)	Break Point Heights (NHTS-1) (Not more than 2)
41-50	F10.3	BPH(NHTS-1)	
51-60	F10.3	HINT(1)	Followed by Representative Area Heights (NHT) (Not More Than 3)
61-70	F10.3		If NHTS = 1, then HINT(1) goes in columns 41-50
71-80	F10.3	HINT(NHTS)	

Card Type 3: Meteorological Parameters (for each hour) -

Columns	Format	Variable	Comments
(1) Card Type 3.1			
1-5	-	-	Optional Hour Number (i.e., 1-24)
6-10	I5	IKST	Stability Class (dimensionless)
11-20	F10.1	QHL	Mixing Height (m)
21-30	F10.1	QTEMP	Ambient Temperature (°K)

Columns	Format	Variable	Comments
(2) Card Type 3.2: For each station -			
6-10	I5	JSTA	Station number (1-50); must be in ascending order
11-20	F10.1	QTHETA	Wind direction (degrees)
21-30	F10.1	QU	Wind speed (m/sec)

Columns	Format	Variable	Comments
Card Type 4: Specific Receptor Locations - One for each receptor. (Read only if IOPT (3) = 1)			
1-8	2A4	RNAME	Receptor Identification
10-19	F10.3	RREC	East Coordinate (user units)
20-29	F10.3	SREC	North Coordinate (user units)

A blank card must follow the last receptor card.

Columns	Format	Variable	Comments
Card Type 5: Limits of Honeycomb Receptors (Read only if IOPT(6) = 1)			
1-10	F10.2	HRMIN	East Minimum coordinate (user units)
11-20	F10.2	HRMAX	East Maximum coordinate (user units)
21-30	F10.2	HSMIN	North Minimum coordinate (user units)
31-40	F10.2	HSMAX	North Maximum coordinate (user units)

Appendix A of original user's guide contains a glossary of the variable names if more description of these variables is necessary.

```
C
C     MAIN
C
      INTEGER KEY(4)/'PARA','STAT','WEIG','RAN'/,N/4/,
     X   KEY(5),TITLE(13)
   10 READ(5,5010,END=9000) KEY,NMAX,TITLE
 5010 FORMAT(3A4,T18,I3,12A4,A2)
      DO 20 I=1,N
      IF(KEY(I).EQ.KEY(I)) GO TO 30
   20 CONTINUE
      WRITE(6,6020) KEY(I)
 6020 FORMAT('0',T11,'INVALID KEYWORD ',A4/T11,'EXECUTION TERMINATED.')
      STOP 1
   30 WRITE(6,6030) KEY,TITLE
 6030 FORMAT('1',T11,3A4/T21,12A4,A2///)
      GO TO (100,200,300,400),I
  100 CALL INPAR
      GO TO 10
  200 CALL INSTA
      GO TO 10
  300 CALL WEIGHT
      GO TO 10
  400 IF(NMAX.LE.0) NMAX=1
      WRITE(6,6400) NMAX
 6400 FORMAT(T21,'NUMBER OF ITERATIONS USED IN COMPUTING TRAVEL',
     X   ' DISTANCE IS ',I3///)
      CALL RAN(NMAX)
      GO TO 10
 9000 WRITE(6,6900)
 6900 FORMAT('0END OF PROGRAM.')
      STOP
      END



      SUBROUTINE INSTA
      INTEGER END,STAID(8)
      LOGICAL MULTI
      COMMON /PTS/ PX(50),PY(50),NI(50),NSTA,MULTI
      WRITE(6,6010)
 6010 FORMAT('0',T21,'STATION NO.',T36,'X',T46,'Y',T56,'WEIGHT',T101,
     X   'IDENTIFICATION'/)
      DO 100 NSTA=1,51
      READ(5,5010) END,NO,X,Y,Z,STAID
 5010 FORMAT(2I5,3F10.3,7A4,A2)
      IF(END.EQ.9999) GO TO 200
      IF(STA.EQ.51) GO TO 105
      IF(NO.NE.NSTA) GO TO 500
      WRITE(6,6100) NO,X,Y,Z,STAID
 6100 FORMAT(T20,I3,T41,F8.2,T61,F8.2,T86,F8.1,T101,7A4,A2)
      PX(NSTA)=X
      PY(NSTA)=Y
      NI(NSTA)=Z
  100 CONTINUE
  105 WRITE(6,6105)
 6105 FORMAT('0',T21,'MORE THAN 50 STATIONS HAVE BEEN SPECIFIED.'/T21,
     X   'EXECUTION TERMINATED.')
      STOP 1
  500 WRITE(6,6500) NO
 6500 FORMAT('0',T21,'STATION NO.',I3,' IS OUT OF SEQUENCE.'/T21,
     X   'EXECUTION TERMINATED.')
      STOP 1
  200 NSTA=NSTA-1
      MULTI=NSTA.GT.1
      RETURN
      END



      SUBROUTINE INPAR
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,ALPHA,LTHETA,RADIUS,POWER
      LOGICAL NOFACT,LTHETA
      COMMON /FACTOR/ FACT(50,10,10),NOFACT
      NAMELIST /INGRID/ ORIGIN,NX,NY,GX,GY,THETA,FACT,NOFACT,
     X   LTHETA,RADIUS,POWER
      REAL THETA/89.0/
      LTHETA=.TRUE.
      RADIUS=1.0
      POWER=2.0
      READ(5,INGRID)
      IF(NX.LT.1.OR.NX.GT.10.OR.NY.LT.1.OR.NY.GT.10) GO TO 500
      WRITE(6,6010) ORIGIN,NX,NY,GX,GY,      NOFACT,POWER
 6010 FORMAT(T21,'ORIGIN: (',F7.2,', ',F7.2,')'//10X,T21,
     X                'WEIGHTING GRID NX=',I2,T51,'WEIGHTING GRID NY=',
     X   I2/10X,T21,'WEIGHTING GRID GX=',F5.2,T51,'WEIGHTING GRID GY=',
     X   F5.2//10X,T21,'NO WEIGHTING FACTORS (',L1,')',T51,
     X   'POWER=',F6.1)
      IF(LTHETA) WRITE(6,6011) THETA
      IF(.NOT.LTHETA) WRITE(6,6012) RADIUS
 6011 FORMAT('0',T21,'SEARCH ANGLE=',F8.1)
 6012 FORMAT('0',T21,'SEARCH RADIUS=',F7.2)
      ALPHA=THETA*0.0087266666
      RETURN
  500 WRITE(6,6500)
 6500 FORMAT('0',T21,'GRID DIMENSIONS ARE OUT OF RANGE.'/T21,
     X   'EXECUTION TERMINATED.')
      STOP 1
      END
```

```
      SUBROUTINE WEIGHT
      INTEGER END
      LOGICAL MULTI
      COMMON /PTS/ PX(50),PY(50),HT(50),NSTA,MULTI
      LOGICAL NOFACT,LTHETA
      COMMON /FACTOR/ FACT(50,10,10),NOFACT
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,THETA,LTHETA,RADIUS,POWER
      NOFACT=.FALSE.
      WRITE(6,6010)
 6010 FORMAT('0',T21,'STATION NO.',T41,'CELL NO. (X)',T61,'CELL NO. (Y)'
     *   ,T81,'WEIGHTING FACTOR'/)
      DO 10 IY=1,NY
      DO 10 IX=1,NX
      DO 10 ISTA=1,NSTA
   10 FACT(ISTA,IX,IY)=1.0
   20 READ(5,5020) END,NO,IX,IY,FIELD
 5020 FORMAT(4I5,E10.0)
      IF(END.EQ.99999) GO TO 100
      IF(NO.LT.1.OR.NO.GT.NSTA.OR.IX.LT.1.OR.IX.GT.NX.OR.IY.LT.1
     *   .OR.IY.GT.NY) GO TO 500
      FACT(NO,IX,IY)=FIELD
      WRITE(6,6020) NO,IX,IY,FIELD
 6020 FORMAT(T26,I3,T46,I2,T66,I2,T86,F6.4)
      GO TO 20
  100 RETURN
  500 WRITE(6,6500)
 6500 FORMAT('-',T21,'INVALID INDEX (OR INDICES)'/T21,
     *   'EXECUTION TERMINATED.')
      STOP 1
      END


      SUBROUTINE UVCALC
      LOGICAL MULTI
      COMMON /PTS/ PX(50),PY(50),HT(50),NSTA,MULTI
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,ALPHA,LTHETA,RADIUS,POWER
      LOGICAL NOFACT,LTHETA
      COMMON /FACTOR/ FACT(50,10,10),NOFACT
      COMMON /METCON/ACHI(150),PCHI(150),ASIGS(150,11),PSIGS(150,26),
     *IASIGS(46),IPSIGS(177),KST,HL,TEMP,SINT,COST,
     *WD(50),WS(50),BPH(2),IWD,NMAX,
     *PARTC(177),AWCHI(150),PWCHI(150),AWSIGS(150,11),PWSIGS(150,26)
      REAL RDIST(50),U(50),V(50)
      INTEGER STAND(50)
      LOGICAL WKEY
      DO 20 ISTA=1,NSTA
      TRAD=WD(ISTA)*0.01745329
      U(ISTA)=WS(ISTA)*SIN(TRAD)
   20 V(ISTA)=WS(ISTA)*COS(TRAD)
      RETURN
C
C     - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
C
      ENTRY WFIELD([illegible])
      WFACT=1.
      NEXT=1
C
C     DETERMINE THE WEIGHTING GRID CELL LOCATION OF THE RECEPTOR POINT
C
      IX=INT((RX-ORIGIN(1))/GX+1)
      IY=INT((RY-ORIGIN(2))/GY+1)
      IF(IX.LE.0.OR.IX.GT.NX.OR.IY.LE.0.OR.IY.GT.NY) GO TO 25
      WKEY=.NOT.NOFACT
      GO TO 30
   25 WKEY=.FALSE.
   30 SIGU=0.
      SIGV=0.
      SIGW=0.
      DO 40 ISTA=1,NSTA
   40 STAND(ISTA)=ISTA
C
C     ORDER STATIONS BASED UPON MINIMUM RADIUS
C
      DO 50 ISTA=1,NSTA
   50 RDIST(ISTA)=SQRT((RX-PX(ISTA))**2+(RY-PY(ISTA))**2)
      CALL SORT(RDIST,STAND,NSTA)
   60 DO 70 JSTA=NEXT,NSTA
      ISTA=STAND(JSTA)
      IF(ISTA.EQ.0) GO TO 70
C
C     SELECT FIRST STATION BASED UPON MINIMUM (AT THAT TIME) DISTANCE
C
      IF(WKEY) WFACT=FACT(ISTA,IX,IY)
      WEIGHT=WFACT/(RDIST(ISTA)**POWER+1.0E-06)
      SIGU=SIGU+U(ISTA)*WEIGHT
      SIGV=SIGV+V(ISTA)*WEIGHT
      SIGW=SIGW+WEIGHT
```

```
      STAND(JSTA)=0
      IF(JSTA.LT.NSTA) GO TO 80
   70 CONTINUE
      GO TO 150
   80 DX1=PX(ISTA)-RX
      DY1=PY(ISTA)-RY
      IF(DX1.EQ.0..AND.DY1.EQ.0.) GO TO 150
      ALPH1=ATAN2(DY1,DX1)
      TX=PX(ISTA)
      TY=PY(ISTA)
      NEXT=JSTA+1
      DO 100 JSTA=NEXT,NSTA
      ISTA=STAND(JSTA)
      IF(ISTA.EQ.0) GO TO 100
C
C     REJECT ANY STATION WITHIN A SECTOR OF
C     ALPHA DEGREES OF THE SELECTED STATION
C
      IF(.NOT.LTHETA) GO TO 90
C
      DX2=PX(ISTA)-RX
      DY2=PY(ISTA)-RY
      ALPH2=ATAN2(DY2,DX2)
      IF(ABS(ALPH1-ALPH2).LT.ALPHA) STAND(JSTA)=0
      GO TO 100
C
C     REJECT ANY STATION WITHIN A MINIMUM SEARCH DISTANCE (RADIUS) OF
C     THE SELECTED STATION
C
   90 IF(SQRT((TX-PX(ISTA))**2+(TY-PY(ISTA))**2).LE.RADIUS)
     X   STAND(JSTA)=0
C
  100 CONTINUE
      GO TO 60
  150 UN=SIGU/SIGR
      VN=SIGV/SIGR
      THETA=ANGARC(UN,VN)
      U=SQRT(UN**2+VN**2)
      RETURN
      END


      BLOCK DATA
      LOGICAL NOFACT,LTHETA
      COMMON /FACTOR/ FACT(50,10,10),NOFACT
      DATA FACT/5000*1./,NOFACT/.TRUE./
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,THETA,LTHETA,RADIUS,POWER
      DATA ORIGIN/0.,0./,GX,GY/2*1.0/,NX,NY/2*1/
      END



      SUBROUTINE UNPOL(T,IM,CONC)                                       00010760
C*** THIS SUBROUTINE INTERPOLATES A TABLE OF INTEGRATION VALUES         00010770
C*** TO DETERMINE THE CONCENTRATION AT A GIVEN TIME AND HEIGHT          00010780
      COMMON /SIGMA/CIN(3,240),AY(6,7),BY(6,7),AZ(6,7),BZ(6,7),TIME(5)  00010790
      IF(T.LT.10.) GO TO 753                                            00010800
      IF(T.GE.100.0) GO TO 750                                          00010810
      IT1=T/10.                                                         00010820
      TL=10*IT1                                                         00010830
      TU=TL+10.                                                         00010840
      GO TO 752                                                         00010850
  750 IF(T.GE.1000.) GO TO 751                                          00010860
      IT1=IFIX(T/100.)+9                                                00010870
      TL=100*(IT1-9)                                                    00010880
      TU=TL+100.                                                        00010890
      GO TO 752                                                         00010900
  751 IT1=IFIX(T/1000.)+18                                              00010910
      TL=1000*(IT1-18)                                                  00010920
      TU=TL+1000.                                                       00010930
  752 IT2=IT1+1                                                         00010940
      C1=CIN(IM,IT1)                                                    00010950
      CONC=C1+((T-TL)/(TU-TL))*(CIN(IM,IT2)-C1)                         00010960
      RETURN                                                            00010970
  753 CONC=0.1*T*CIN(IM,1)                                              00010980
      RETURN                                                            00010990
      END                                                               00011000
```

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      SUBROUTINE JMPMSZ(MSAV)
C***DIMENSION CHANGES IN POINT SOURCES WITH Z00.                          00011010
      COMMON  /SIGMA/CIN(3,200),AY(6,7),BY(6,7),AZ(6,7),BZ(6,7),TIME(5)  00011020
      COMMON /SOME/IA(25,25),SOURCE(6,177),ASOURC(6,40),                 00011030
     *UNITS,CONVRM,RREC(150),SREC(150),*PS(25),MAS(10),IOPT(10),IPOL,    00011040
     *NREC&P,RMIN,RMAX,SMIN,SMAX,IRSIZE,ISSIZE,NPT,NAB,NSIGP,NSIGA,CONVM 00011050
      COMMON /METCON/ACMI(150),PCMI(150),ABIGS(150,11),PSIGS(150,26),    00011060
     *IASIGB(40),IPSIGS(177),*ST,*L,TEMP,SINT,COST,                      00011070
     *ALPHA(50),UA(50),*P(50),*C,*MAX,
     *PART(177),AMLMI(150),*CLMI(150),AMSIGS(150,11),PMSIGS(150,26)
      LOGICAL MULTI
      COMMON /PTS/ PX(50),PY(50),HT(50),NSTA,MULTI
      COMMON ITYPE(150),ICOUR(150),IX,IU,NIP,NID,NHOURS,PM               00011100
      DIMENSION DAY(42),DBY(42),DAZ(42),DMZ(42),*SAV(NPT),PL(7)          00011110
      EQUIVALENCE (AY(1),DAY(1)),(BY(1),DBY(1)),
     *   (AZ(1),DAZ(1)),(MZ(1),DMZ(1))
      DATA PL/0.1,0.15,0.20,0.25,0.30,.30/                               00011130
      EQUIVALENCE (UA(1),U),(ALPHA(1),THETA)
C***SET VALUE OF THRESHOLD CONCENTRATION                                 00011140
      THOLD=10.0E-20                                                     00011150
C***ZERO EFFECTIVE STACK HEIGHT FOR EACH SOURCE                          00011160
      DO 709 J=1,NPT                                                     00011170
  709 MSAV(J)=0.0                                                        00011180
C***LOOP ON RECEPTORS***                                                 00011190
      DO 505 K=1,NRECEP                                                  00011200
      DO 714 I=1,NPT                                                     00011210
  714 PART(I)=0.0                                                        00011220
C***                                                                     00011230
C***CALCULATE CONCENTRATIONS FROM POINT SOURCES***                       00011240
C***      LOOP ON POINT SOURCES                                          00011250
C***                                                                     00011260
      DO 700 J=1,NPT                                                     00011270
C***  MODIFY WIND SPEED BY POWER LAW PROFILE                             00011280
      HS=SOURCE(1,J)                                                     00011290
      SZ=SIGMAZ(J)                                                       00011300
      IF(HS.GT.ZMAX(K))
      U=HS*SREC(K)
      P=ACTR1,
      IF(SOURCE(5,J).GT.1.0) P=ACTR(SOURCE(5,J))/10.,/**PL(KST)
      IF(.NOT.MULTI) GO TO 712
      CALL MPIELD(M,SZ,SY,U)
      CALL MPIELD(1,SZ(M+1),SZ,SY(SREC(K)+50),THETA,CHIV)
      CALL METAER(UTAS)
      SINT=SIN(THA)
      COST=COS(THA)
      CALL MPIGMP(ALT
  712 CONTINUE
C***DETERMINE GROUND REFLECTION                                          00011320
      IF(SOURCE(5,J).EQ.1.0) GO TO 700                                   00011330
C***                                                                     00011340
C***DETERMINE CONTRIBUTION (IF ANY) FROM J-TH SOURCE                     00011350
C***                                                                     00011360
      IF(MULTI) TEMP=
      ENDIF
C***                                                                     00011470
C***DETERMINE THE TIME INTERVAL AND CALL DATA SIGMA Y                    00011480
C***                                                                     00011490
      GO TO (701,
      IF(I.GT.
  701 CONTINUE
      I=M
  709 I=M+1
      ASUM=(
      SY=AY(
C***                                                                     00011510
C***DETERMINE EFFECTIVE CALCULATION FOR SIGMA Y                          00011520
C***                                                                     00011530
      IF(IOPT/(SY+SZ)).GT.100.) GO TO 702                                00011540
      SOURCE(IPOL,J)/(SY*SZ*U*1.)                                        00011550
      IF(CONV.LT.THOLD) GO TO 702                                        00011560
      MSAV(J)=1                                                          00011570
C***SKIP PLUME RISE CALCULATION IF EFFECTIVE HEIGHT HAS ALREADY BEEN     00011580
C***   CALCULATED FOR THIS SOURCE                                        00011590
      IF(MSAV.GT.0) GO TO 710                                            00011600
C***                                                                     00011610
C***CALCULATE PLUME RISE AND ADD PHYSICAL HEIGHT TO OBTAIN EFFECTIVE STA00011620
C***                                                                     00011630
      CALL JMPMSZ(MP,MJ,SOURCE(5,J),SOURCE(6,J),SOURCE(7,J),
     *ST,UL,Z,TEMP)                                                      00011650
      MSAV(J)=MJ                                                         00011660
C***                                                                     00011670
C***CALCULATE SIGMA Z                                                    00011680
C***                                                                     00011690
  710 SZ=AZ(ISUB)*X**BMZ(ISUB)                                           00011700
      IF(SZ.GT.5000.) SZ=5000.                                           00011710
C***                                                                     00011720
C***CALCULATE CONTRIBUTION FROM THE J-TH SOURCE AT THE K-TH RECEPTOR     00011730
C***                                                                     00011740
      HTF=HS+MJ+SZ+SZ                                                    00011750
      IF(HTF**P.GE.100.) GO TO 708                                       00011760
      IF(HTF**P.GT.ML) GO TO 709                                         00011770
C***IF STABLE CONDITIONS OR UNLIMITED MIXING HEIGHT,                     00011780
C***USE EQUATION 3.2 FOR Z=0.                                            00011790
      IF(M3)404) 401,401,707                                             00011800
  401 IF(ML=5000.) 402,707,707                                           00011810
C***IF SIGMA=Z IS GREATER THAN 1.6 TIMES THE MIXING HEIGHT,              00011820
C***THE DISTRIBUTION BELOW THE MIXING HEIGHT IS UNIFORM WITH             00011830
C***HEIGHT REGARDLESS OF SOURCE HEIGHT.                                  00011840
  402 IF(SZ/ML=1.6) 403,403,403                                          00011850
  403 P=0.5*EXP(-0.5*(0-HS)**2/SY**2)                                    00011860
      GO TO 405                                                          00011870
  404 A=0.                                                               00011880
      B=1.0/(0.282*UP**SY*SZ)                                            00011890
      A2=0.0                                                             00011900
      C2=2.0*SZ**2                                                       00011910
      HTE=HTF**P                                                         00011920
      A2=2./EXP(HTE)                                                     00011930
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      SUMSU,0                                                          00011950
      TML82,0ML                                                        00011960
  408 ASUAN+1,                                                         00011970
      AUS0,                                                            00011980
      AAS0,                                                            00011990
      CSSAN+TML                                                        00012000
      CCSMJ+CS                                                         00012010
      CLSMJ+CS                                                         00012020
      CSSCC+CC/C2                                                      00012030
      CASCL+CC/C2                                                      00012040
      IF(CS+50,) 409,410,410                                           00012050
  409 AUS2,/EXP(CS)                                                    00012060
  410 IF(CS+50,) 411,412,412                                           00012070
  411 AAS2,/EXP(CS)                                                    00012080
  412 TOTAL=AA+AS                                                      00012090
      SU=SU+TOTAL                                                      00012100
      IF(TOTAL,GT,0,01) GO TO 408                                      00012110
      PRODUA1+(A2+SU)                                                  00012120
      GO TO 405                                                        00012130
  707 PRODS1CDU=+EXP(+,5+MTEMP))/(3,14159/2,0/2,0*3,0*3,0)             00012140
C***INCREMENT CONCENTRATION AT MATH RECEPTOR                           00012150
  405 PC=I(K)=PC=I(K)+PMUD                                             00012160
      PMC=I(K)=PMC=I(K)+PMUD                                           00012170
      +SIG=IPSIGS(J)                                                   00012180
      IF(+SIG,EQ,0) GO TO 713                                          00012190
      PSIGS(K,+SIG)=PSIGS(K,+SIG)+PMUD                                 00012200
      PMSIGS(K,+SIG)=PMSIGS(K,+SIG)+PMUD                               00012210
      PSIGS(K,26)=PSIGS(K,26)+PMUD                                     00012220
      PMSIGS(K,26)=PMSIGS(K,26)+PMUD                                   00012230
  713 PART(IJ)=PMUD                                                    00012240
  700 CONTINUE                                                         00012250
C*****ITE PARTIAL CONCENTRATIONS ON DISK                               00012260
      IF(IOPT(8),EQ,0) GO TO 503                                       00012270
      WRITE(NIP,715) K,MAXTC                                           00012280
  715 FORMA(1H,,1P0E12,4)                                              00012290
  503 CONTINUE                                                         00012300
      RETURN                                                           00012310
      END                                                              00012320
```

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      SUBROUTINE UMPZ(MSAV,Z)                                          00012330
      COMMON  /SIGMA/CIN(3,200),A+(6,7),BY(6,7),AZ(6,7),BZ(6,7),TIME(5) 00012340
      COMMON /SOURC/IA(25,25),SOURCE(8,177),ASORC(6,46),               00012350
     +OUTT,CINSAV,XREC(150),SREC(150),+PS(25),HAB(10),IOPT(10),TPUL,   00012360
     +NRECEP,MIN,MMAX,SMIN,SMAX,I+SIZE,ISSIZE,NPT,NAS,NSIGP,NSIGA,CUNUM
      COMMON /METCON/ALM(150),PC=I(150),ASIGS(150,11),PSIGS(150,26),   00012380
     +IASIGS(+6),IPSIGS(177),+ST,+L,TEMP,SINT,CUST,
     +ALPHA(50),UA(50),+PM(2),I+U,NMAX,
     +PART(177),AMC=I(150),PMC=I(150),+MSIGS(150,11),PMSIGS(150,26)
      LOGICAL MULTI
      COMMON /PTS/ PX(50),PY(50),MT(50),NSTA,MULTI
      COMMON /TYPE/ISOU(150),IN,IC,NIM,NID,NHOURS,AM                   00012410
      DIMENSION UA(+6),+UTSMO(+6),+AZ(+6),+MZ(+6),MSAV(NPT),PL(7)      00012420
      EQUIVALENCE (AY(1),+AY(1)),(MY(1),+BY(1)),
     +   (AZ(1),+AZ(1)),(MZ(1),+BZ(1))
      DATA PL/0,1,0,15,0,20,0,25,0,30,0,35/                            00012440
      EQUIVALENCE (UA(1),C),(ALPHA(1),TMLTA)
C***SET VALUE OF THRESHOLD CONCENTRATION                               00012450
      THRESH10,0E-20                                                   00012460
C***FIND EFFECTIVE STACK HEIGHT FOR CALM SOURCE                        00012470
      DO 709 J=1,NPT                                                   00012480
  709 MSAV(J)=0                                                        00012490
C***LOOP OF RECEPTORS***                                               00012500
      DO 503 K=1,NRECEP                                                00012510
      DO 714 I=1,NPT                                                   00012520
  714 PART(I)=0,                                                       00012530
C***                                                                   00012540
C***CALCULATE CONCENTRATIONS FROM POINT SOURCES***                     00012550
C***     LOOP ON POINT SOURCES                                         00012560
C***                                                                   00012570
      DO 700 J=1,NPT                                                   00012580
C*** MULTIPLY WIND SPEED BY POWER LAW PROFILE                          00012590
      HWSOURCE(1,J)                                                    00012610
      SW=SOURCE(2,J)                                                   00012620
      XDUM=SW=XREC(K)
      YDUM=SW=SREC(K)
      PFACT=1,
      IF(SOURCE(5,J),GT,10,) PFACT=(SOURCE(5,J)/10,)**PL(+ST)
      IF(,NOT,+MULTI) GO TO 712
      CALL +PIELD(XW,SW,WD,U)
      CALL +PIELD(,5*(+XREC(K)+PW),,5*(SREC(K)+SW),THETA,U=10)
      TRAD=THETA+0,017453Z9
      SINT=SIN(TRAD)
      CUST=COS(TRAD)
      UPL=SUMID=PFACT
  712 UPL=U=PFACT
C***DETERMINE UPWIND DISTANCE                                          00012630
      XR(YDUM=COST+XDUM=SINT)=CUNUM
      IF(X,LE,0,0) GO TO 700                                           00012670
C***                                                                   00012680
C***DETERMINE CROSS-WIND DISTANCE R SIGMA Y                            00012690
C***                                                                   00012700
      YR(YDUM=SINT-XDUM=CUST)=CUNUM
      UTSUPL
      IF(+MULTI) UTSUPL=
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      700/01
C
C     DETERMINE THE TIME CATEGORY AND CALCULATE SIGMA Y                    00012730
C                                                                          00012740
      DO 701 IY=1,5                                                        00012750
      IF(T.GE.TIME(IY)) GO TO 702                                          00012760
  701 CONTINUE                                                             00012770
      IY=6                                                                 00012780
  702 ITM7=IY                                                              00012790
      ISUBGI=IY+6*(KST-1)                                                  00012800
      SYSQAY(ISUB)=A*X**(B*Y(ISUB)                                         00012810
C                                                                          00012820
C     PRELIMINARY CALCULATIONS FOR CONCENTRATION                           00012830
C                                                                          00012840
      SYSQRT=Y/(SY+SY)                                                     00012850
      IF(SY30.GE.300.) GO TO 700                                           00012860
      COUM=SOURCE(IPOL,J)/EXP(.5*SY30)                                     00012870
      IF(COUM.LE.THOLD) GO TO 700                                          00012880
      MJ=MBAV(J)                                                           00012890
C     SKIP PLUME RISE CALCULATION IF EFFECTIVE HEIGHT HAS ALREADY BEEN     00012900
C        CALCULATED FOR THIS SOURCE                                        00012910
      IF(MJ.GT.0.0) GO TO 710                                              00012920
C                                                                          00012930
C     CALCULATE PLUME RISE AND ADD PHYSICAL HEIGHT TO OBTAIN EFFECTIVE STA 00012940
C                                                                          00012950
      CALL JHMPRS(MF,MJ,SOURCE(5,J),SOURCE(6,J),SOURCE(8,J),SOURCE(7,J),   00012960
     *KST,UPL,X,TEMP)                                                     00012970
      MBAV(J)=MJ                                                           00012980
C                                                                          00012990
C     CALCULATE SIGMA Z                                                    00013000
C                                                                          00013010
  710 SZ=QAZ(ISUB)*X**QBZ(ISUB)                                            00013020
      IF(SZ.GT.5000.) SZ=5000.                                             00013030
C                                                                          00013040
C     CALCULATE CONTRIBUTION FROM THE JTH SOURCE AT THE KTH RECEPTOR       00013050
      ICK=1                                                                00013060
      IF(Z.GT.ML) ICK=2                                                    00013070
      IF(MJ.GT.ML) ICK=ICK+1                                               00013080
      GO TO(430,700,450),ICK                                               00013090
  430 WRITE(IO,431)                                                        00013100
  431 FORMAT(1X,'CALCULATION CAN NOT BE PERFORMED WHEN BOTH Z AND H ARE    00013110
     *ABOVE THE MIXING HEIGHT')                                           00013120
      GO TO 700                                                            00013130
  450 IF(A.LT.0.001) GO TO 700                                             00013140
      IF(KST-4) 401,401,707                                                00013150
  401 IF(ML-5000.) 402,707,707                                             00013160
C     IF SIGMAZ IS GREATER THAN 1.6 TIMES THE MIXING HEIGHT,               00013170
C     THE DISTRIBUTION WITHIN THE MIXING HEIGHT IS UNIFORM WITH            00013180
C     HEIGHT REGARDLESS OF SOURCE HEIGHT.                                  00013190
  402 IF(SZ/ML-1.6) 404,404,403                                            00013200
  403 PHOD=QOUM/(2.506*UPL*SY*ML)                                          00013210
      GO TO 405                                                            00013220
  404 A1=0.                                                                00013230
      A1=QOUM/(6.283185*UPL*SY*SZ)                                         00013240
      A2=0.                                                                00013250
                                                                           00013260
      A3=0.                                                                00013270
      C2=Z_+SZ*SZ                                                          00013280
      CAZ=MJ                                                               00013290
      CBZ=MJ                                                               00013300
      C3=CA*CA/C2                                                          00013310
      C4=CB*CB/C2                                                          00013320
      IF(C3.LT.50.) A2=1./EXP(C3)                                          00013330
      IF(C4.LT.50.) A3=1./EXP(C4)                                          00013340
  407 SUM=0.                                                               00013350
      TML=2.*ML                                                            00013360
  408 AN=AN+1.                                                             00013370
      A1=0.                                                                00013380
      A5=0.                                                                00013390
      AN=0.                                                                00013400
      A7=0.                                                                00013410
      C5=AN*TML                                                            00013420
      CC=CA+C5                                                             00013430
      CD=CB+C5                                                             00013440
      CE=CA-C5                                                             00013450
      CF=CB-C5                                                             00013460
      CA=CC*CC/C2                                                          00013470
      C7=CD*CD/C2                                                          00013480
      CA=CE*CE/C2                                                          00013490
      C9=CF*CF/C2                                                          00013500
      IF(C6.LT.50.) A4=1./EXP(C6)                                          00013510
      IF(C7.LT.50.) A5=1./EXP(C7)                                          00013520
      IF(C8.LT.50.) A6=1./EXP(C8)                                          00013530
      IF(C9.LT.50.) A7=1./EXP(C9)                                          00013540
  412 TOTAL=A4+A5+A6+A7                                                    00013550
      SUM=SUM+TOTAL                                                        00013560
      IF(TOTAL.LT.0.01) GO TO 409                                          00013570
      GO TO 408                                                            00013580
  409 PHOD=A1*(A2+A3+SUM)                                                  00013590
      GO TO 485                                                            00013600
  707 C2=Z_+SZ*SZ                                                          00013610
      A2=0.                                                                00013620
      A3=0.                                                                00013630
      CAZ=MJ                                                               00013640
      CBZ=MJ                                                               00013650
      C3=CA*CA/C2                                                          00013660
      C4=CB*CB/C2                                                          00013670
      IF(C3.LT.50.) A2=1./EXP(C3)                                          00013680
      IF(C4.LT.50.) A3=1./EXP(C4)                                          00013690
      PHOD=QOUM*(A2+A3)/(6.283185*UPL*SY*SZ)                               00013700
C     INCREMENT CONCENTRATION AT KTH RECEPTOR                              00013710
  485 PLM=I(K)*PCM=I(K)*PHOD                                               00013720
      PMC=I(K)*PMCM=I(K)*PHOD                                              00013730
      K3TG=IPSIGS(J)                                                       00013740
      IF(K3IG.EQ.0) GO TO 713                                              00013750
      PSIGS(K,K3IG)=PSIGS(K,K3IG)+PHOD                                     00013760
      PMSIGS(K,K3IG)=PMSIGS(K,K3IG)+PHOD                                   00013770
      PSIGS(K,26)=PSIGS(K,26)+PHOD                                         00013780
      PMSIGS(K,26)=PMSIGS(K,26)+PHOD                                       00013790
  713 PAR=C(J)*PHOD                                                        00013800
  700 CONTINUE                                                             00013810
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C***WRITE PARTIAL CONCENTRATIONS ON DISK                                00013820
      IF(IUPT(8).EQ.0) GO TO 503                                        00013830
      WRITE(NIP,715) K,PARTC                                            00013840
  715 FORMAT(I4,100E14.4)                                               00013850
  503 CONTINUE                                                          00013860
      RETURN                                                            00013870
      END                                                               00013880
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      SUBROUTINE JMMOVE(LM)                                             00013890
      COMMON /METCON/ACHI(150),PCHI(150),ABIGB(150,11),PBIGB(150,26),   00013900
     *IABTGS(99),IPBIGB(177),NBT,ML,TEMP,BINT,COST,
     *TMETA(50),U(50),BPH(2),IND,NMAX,
     *PARTC(177),AMCHI(150),PMCHI(150),AMBIGB(150,11),PMBIGB(150,26)
      COMMON /BCHC/IA(25,25),SOURCE(8,177),ABURC(8,46),                 00013930
     *UNITS,CONCM,WWEC(150),BMEC(150),MPB(25),MAB(10),IUPT(10),IPOL,    00013940
     *WECEP,WMIN,WMAX,BMIN,BMAX,IRSIZE,ISSIZE,NPT,NAB,NBIGP,NBIGA,CONUM
      COMMON /METDAT/ DTHETA(50,24),DU(50,24),IKBT(24),DML(24),DTEMP(24)
      LOGICAL MULTI
      COMMON /MTS/ PX(50),PY(50),PF(50),NSTA,MULTI
      COMMON ITYPE(150),ICODE(150),IN,IUSNIP,NID,NHOURS,PM              00013970
      DIMENSION GNAMDT(150),IHAM(150),GNAMDB(150),IPOLT(2)              00013980
      DATA IPOLT/'SO2 ','PART'/                                         00013990
      IPOL=IPOLT(1)                                                     00014000
      IF(IPOL.EQ.4) IPOL=IPOLT(2)                                       00014010
      IF(IUPT(4).EQ.0) GO TO 810                                        00014020
C***                                                                    00014030
C***WRITE POINT SOURCE TABLE                                            00014040
  820 IF(IUPT(1).EQ.0) GO TO 200                                        00014050
      WRITE(IU,10) IPOL,LM                                              00014060
   10 FORMAT('1',T30,A4,' CONTRIBUTION(G/CU. M) FROM SIGNIFICANT POINT SO00014070
     *URCES A MONTH',I2X,I4,'WHERE')                                    00014080
      IF(NSIGP.GT.100 GO TO 100                                         00014090
C***PRINT FIRST PAGE OF OUTPUT AND TOTALS                               00014100
      WRITE(IU,11) (I,I=1,NSIGP)                                        00014110
   11 FORMAT('0',T10,10(I5,7X))                                         00014120
      WRITE(IU,12)                                                      00014130
   12 FORMAT('0',T1,'TOTAL     TOTAL'/1X,T13,'SIGNIF    ALL POINT'/1X00014140
     1,T13,'POINT    SOURCES'/1X,'SOURCE #')                            00014150
      WRITE(IU,13) (MPB(I),I=1,NSIGP)                                   00014160
   13 FORMAT('0',T12,10(I5,7X))                                         00014170
      WRITE(IU,14)                                                      00014180
   14 FORMAT(1X,'RECEP #')                                              00014190
      DO 15 M=1,NRECEP                                                  00014200
      WRITE(IU,16) M,(PMBIGB(M,I),I=1,NSIGP)                            00014210
   16 FORMAT(1X,I3,3X,1P10E10.3)                                        00014220
C***PRINT TOTALS***                                                     00014230
      WRITE(IU,18)  PMBIGB(M,26),PMCHI(M)                               00014240
   18 FORMAT('0',T112,1PE10.3)                                          00014250
   15 CONTINUE                                                          00014260
      GO TO 200                                                         00014270
C***PRINT FIRST PAGE                                                    00014280
  100 WRITE(IU,11) (I,I=1,10)                                           00014290
      WRITE(IU,17) (MPB(I),I=1,10)                                      00014300
   17 FORMAT(1X,'SOURCE #',T12,10(I3,7X))                               00014310
      WRITE(IU,14)                                                      00014320
      DO 31 M=1,NRECEP                                                  00014330
   31 WRITE(IU,16) M,(PMBIGB(M,I),I=1,10)                               00014340
      IF(NSIGP.GT.20) GO TO 190                                         00014350
C***PRINT SECOND PAGE AND TOTALS                                        00014360
      WRITE(IU,10) LM                                                   00014370
      WRITE(IU,11) (I,I=11,NSIGP)                                       00014380
      WRITE(IU,12)                                                      00014390
      WRITE(IU,13) (MPB(I),I=11,NSIGP)                                  00014400
```

```
      WRITE(IO,14)
      DO 19 M=1,NRECEP                                                  00014410
      WRITE(IO,18) M,(PMSIGS(M,I),I=11,NSIGP)                           00014420
   19 WRITE(IO,18)  PMSIGS(M,26),PMCM(M)                                00014430
      GO TO 200                                                         00014440
C*****WITE SECOND PAGE                                                  00014450
  150 WRITE(IO,10) LM                                                   00014460
      WRITE(IO,11) (I,I=11,20)                                          00014470
      WRITE(IO,17) (MPS(I),I=11,20)                                     00014480
      WRITE(IO,14)                                                      00014490
      WRITE(IO,18) M,(PMSIGS(M,I),I=11,20)                              00014500
      WRITE(IO,10) LM                                                   00014510
C*****WRITE LAST PAGE AND TOTALS                                        00014520
      WRITE(IO,11) (I,I=21,NSIGP)                                       00014530
      WRITE(IO,12)                                                      00014540
      WRITE(IO,13) (MPS(I),I=21,NSIGP)                                  00014550
      WRITE(IO,14)                                                      00014560
      DO 20 M=1,NRECEP                                                  00014570
      WRITE(IO,18) M,(PMSIGS(M,I),I=21,NSIGM)                           00014580
   20 WRITE(IO,18) PMSIGS(M,26),PMCM(M)                                 00014590
C***                                                                    00014600
C*****WRITE AREA SOURCE TABLE                                           00014610
  200 IF(IOPT(2),EQ,0) GO TO 810                                        00014620
      WRITE(IO,21) IPOL,LM                                              00014630
   21 FORMAT('1',T30,A6,' CONTRIBUTION(UG/M3) FROM SIGNIFICANT AREA SOU00014640
     *RCES 8 HOUR ',I2//1X,T9,'MARK')                                   00014650
      WRITE(IO,11) (I,I=1,NSIGA)                                        00014660
      WRITE(IO,22)                                                      00014670
   22 FORMAT('0',T113,'TOTAL     TOTAL'/1X,T113,'SIGNIF     ALL AREA'/1X,00014680
     1T113,'AREA      SOURCES'/1X,'SOURCE #')                          00014690
      WRITE(IO,13) (MPS(I),I=1,NSIGA)                                   00014700
      WRITE(IO,14)                                                      00014710
      DO 23 M=1,NRECEP                                                  00014720
      WRITE(IO,18) M,(PMSIGS(M,I),I=1,NSIGA)                            00014730
   23 WRITE(IO,18) AMSIGS(M,1),AMCM(M)                                  00014740
C*****OUTPUT SUMMARY TABLE                                              00014750
  810 WRITE(IO,24) IPOL,LM                                              00014760
   24 FORMAT('1',T25,'SUMMARY ',A6,' CONCENTRATION TABLE 8 HOUR ',I2//)  00014770
     *)                                                                 00014780
      WRITE(IO,49)                                                      00014790
   49 FORMAT(' MARK  MIXING    TEMP    STABILITY'/T8,'HEIGHT(M)  (K)',
     *'      CLASS'/)
      WRITE(IO,41) LM,PMCM(LM),ATEMP(LM),ISTAB(LM)
   41 FORMAT(T5,I2,T20,F6.2,T32,I1/'0',
     *      T8,'STATION NO.',T21,'WIND DIRECTION',T41,'WIND SPEED'/T25,
     *   'CLOUD'',T45,'(M/S)'/
     *   T8,'(TENS)',T21,'(TENS)',T41,'(KNOTS)')
   43 FORMAT(T11,I2,T22,F7.0,T42,F9.2)
      WRITE(IO,25)
   25 FORMAT(  'RECEPTOR NO.   EAST      NORTH     ',/X,
     *'CONCENTRATION(UG/M3)'/1X,
     1'SIGNIF POINT   ALL POINT   SIGNIF AREA   ALL AREA   ALL SOURCE'/
     2X,'MARK'/1X,T30,'SOURCES',6X/)
C*****CALCULATE GRAND TOTALS AND MARK CONCENTRATIONS                    00014900
      DO 26 M=1,NRECEP                                                  00014910
                                                                        00014920


      GRAND(M)=AMCM(M)+PMCM(M)                                          00014930
   26 GMARKS(M)=GRAND(M)                                                00014940
C*****DETERMINE MARKING ACCORDING TO CONCENTRATION                      00014950
      DO 28 I=1,NRECEP                                                  00014960
      CMAX=1.0                                                          00014970
      DO 27 M=1,NRECEP                                                  00014980
      IF(GMARKS(M).LE.CMAX) GO TO 27                                    00014990
      CMAX=GMARKS(M)                                                    00015000
      LMAX=M                                                            00015010
   27 CONTINUE                                                          00015020
      IMARK(LMAX)=I                                                     00015030
      GMARKS(LMAX)=0.0                                                  00015040
   28 CONTINUE                                                          00015050
      DO 29 M=1,NRECEP                                                  00015060
      C1=MMCE(M)*UNITS                                                  00015070
      C2=PMCE(M)*UNITS                                                  00015080
      WRITE(IO,30) M,ITYPE(M),IGRUP(M),C1,C2,PMSIGS(M,26),              00015090
     *PMCM(M),AMSIGS(M,1),AMCM(M),GRANDS(M),IMARK(M)                    00015100
   30 FORMAT(1X,T5,I5,1X,A1,I3,4X,F7.2,2X,F7.2,1X,1PE13.4,0PF8.3)       00015110
   29 CONTINUE                                                          00015120
      RETURN                                                            00015130
      END                                                               00015140
```

```
      SUBROUTINE SORT(A,M,N)
      INTEGER A(1),L,U,I,J
      M=N
    1 M=M/2
      IF(M.EQ.0) RETURN
      K=N-M
      DO 10 J=1,K
      I=J
    5 L=I+M
      IF(A(L).GE.A(I)) GO TO 10
      ITEMP=A(I)
      A(I)=A(L)
      A(L)=ITEMP
      I=I-M
      IF(I.GT.0) GO TO 5
   10 CONTINUE
      GO TO 1
      END



      SUBROUTINE SELECT(THETA,IOU)
      REAL LEG(51,90),,180.,,270.,/
      DO 100 I=1,5
      IF(THETA.LE.DEG(I+1)) GO TO 200
  100 CONTINUE
      I=1+5
  200 RETURN
      END



      SUBROUTINE CONFUS(NE,SL,,IOU,MM,SD)
      IF(.NOT.T) IF(I+1-6) 10,20,30
C     CASE 1+1-6 ***
      SUBSCR=
      GO TO 35
C     CASE 10-82 ***
   10 SUBSCR=
      IF MMBSCR=
      GO TO 40
C     CASE I=1 ***
   20 SUBSCR=
      GO TO 35
C     CASE I=2 ***
   30 SUBSCR=
      DO 40 J=1,NE
      IF(SD(J).LT.0.) SD(J)=0.
   40 RETURN
      END



      SUBROUTINE MAP(,MAX,)
C     *** COMPUTE [97] MATCH VERSION OF MAP IF SIGMA VERSION                    00000010
C     ***** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **  00000020
C     MAP IS A GAUSSIAN STRAIGHTFORWARD SMOOTHING OPERATION WHICH DISPERSION MUCH SMICH CAN BE  00000030
C     USED FOR INFORMATION AIR ACCURACY CONSIDERATIONS OF WELL-KNOWN STABLE     00000040
C     FINAL TARGET FLOW SCHEDULING TIMES FOUR AN HOUR TO A DAY IN URBAN AREAS   00000050
C     ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **    00000060
      DIMENSION A(7,8),B(7,8),C(7,8),D(7,8),E(7,8),F(7,8),G(7,8),H(7,8),        00000070
     *AA(7,8),BB(7,8),CC(7,8),DD(7,8),EE(7,8),FF(7,8),GG(7,8),HH(7,8)           00000080
      COMMON /BLOCK1/ A,B,C,D,E,F,G,H,AA,BB,CC,DD,EE,FF,GG,HH                   00000090
      DIMENSION MM(7),NN(7),II(7),JJ(7),KK(7),LL(7),MM(7),NN(7),OO(7),PP(7),    00000100
     *QQ(7),RR(7),SS(7),TT(7),UU(7),VV(7),WW(7),XX(7),YY(7),ZZ(7),AAA(7),       00000110
     *BBB(7),CCC(7),DDD(7),EEE(7),FFF(7),GGG(7),HHH(7),III(7),JJJ(7),KKK(7),    00000120
     *LLL(7),MMM(7),NNN(7),OOO(7),PPP(7),QQQ(7),RRR(7),SSS(7),TTT(7),UUU(7),    00000130
     *VVV(7),WWW(7),XXX(7),YYY(7),ZZZ(7),AAAA(7),BBBB(7),CCCC(7),DDDD(7),       00000140
     *EEEE(7),FFFF(7),GGGG(7),HHHH(7),IIII(7),JJJJ(7),KKKK(7),LLLL(7),          00000150
     *MMMM(7),NNNN(7),OOOO(7),PPPP(7),QQQQ(7),RRRR(7),SSSS(7),TTTT(7),          00000160
     *UUUU(7),VVVV(7),WWWW(7),XXXX(7),YYYY(7),ZZZZ(7)                          00000170
      COMMON /BLOCK2/ AA,BB,CC,DD,EE,FF,GG,HH,II,JJ,KK,LL,MM,NN,OO,PP,QQ,RR,   00000180
     *SS,TT,UU,VV,WW,XX,YY,ZZ,AAA,BBB,CCC,DDD,EEE,FFF,GGG,HHH,III,JJJ,KKK,    00000190
     *LLL,MMM,NNN,OOO,PPP,QQQ,RRR,SSS,TTT,UUU,VVV,WWW,XXX,YYY,ZZZ,AAAA,       00000200
     *BBBB,CCCC,DDDD,EEEE,FFFF,GGGG,HHHH,IIII,JJJJ,KKKK,LLLL,MMMM,NNNN,       00000210
     *OOOO,PPPP,QQQQ,RRRR,SSSS,TTTT,UUUU,VVVV,WWWW,XXXX,YYYY,ZZZZ              00000220
      DIMENSION A(7,8),B(7,8),C(7,8),D(7,8),E(7,8),F(7,8),G(7,8),H(7,8),        00000230
     *AA(7,8),BB(7,8),CC(7,8),DD(7,8),EE(7,8),FF(7,8),GG(7,8),HH(7,8)           00000240
      COMMON /BLOCK1/ A,B,C,D,E,F,G,H,AA,BB,CC,DD,EE,FF,GG,HH                   00000250
      DIMENSION MM(7),NN(7),II(7),JJ(7),KK(7),LL(7),MM(7),NN(7),OO(7),PP(7),    00000260
     *QQ(7),RR(7),SS(7),TT(7),UU(7),VV(7),WW(7),XX(7),YY(7),ZZ(7),AAA(7),       00000270
     *BBB(7),CCC(7),DDD(7),EEE(7),FFF(7),GGG(7),HHH(7),III(7),JJJ(7),KKK(7),    00000280
     *LLL(7),MMM(7),NNN(7),OOO(7),PPP(7),QQQ(7),RRR(7),SSS(7),TTT(7),          00000290
     *UUU(7),VVV(7),WWW(7),XXX(7),YYY(7),ZZZ(7),AAAA(7),BBBB(7),CCCC(7),DDDD(7),00000300
     *EEEE(7),FFFF(7),GGGG(7),HHHH(7),IIII(7),JJJJ(7),KKKK(7),LLLL(7),          00000310
     *MMMM(7),NNNN(7),OOOO(7),PPPP(7),QQQQ(7),RRRR(7),SSSS(7),TTTT(7),          00000320
     *UUUU(7),VVVV(7),WWWW(7),XXXX(7),YYYY(7),ZZZZ(7)                          00000330
      COMMON /BLOCK2/ AA,BB,CC,DD,EE,FF,GG,HH,II,JJ,KK,LL,MM,NN,OO,PP,QQ,RR,   00000340
     *SS,TT,UU,VV,WW,XX,YY,ZZ,AAA,BBB,CCC,DDD,EEE,FFF,GGG,HHH,III,JJJ,KKK,    00000350
     *LLL,MMM,NNN,OOO,PPP,QQQ,RRR,SSS,TTT,UUU,VVV,WWW,XXX,YYY,ZZZ,AAAA,       00000360
     *BBBB,CCCC,DDDD,EEEE,FFFF,GGGG,HHHH,IIII,JJJJ,KKKK,LLLL,MMMM,NNNN,       00000370
     *OOOO,PPPP,QQQQ,RRRR,SSSS,TTTT,UUUU,VVVV,WWWW,XXXX,YYYY,ZZZZ              00000380
```

```
      READ(1+,402) NMOUNS,NSIGP,NSIGA,NMISSP,(BPM(I),I=1,NBP),
     *(M(I),I=1,NMTB)
  402 FORMAT(5I5,5X,8F10.3)
      WRITE(IO,500) (NTB,COUNT,IMBIAS,IBBIAS,NMIN,NMAX,BMIN,BMAX
  500 FORMAT(' THE NUMBER OF USER UNITS PER MINIMUM GRID SQUARE',
     *E11.4/1X,'CONVERSION FACTOR USER UNITS TO KILOMETERS',E11.4/1X,
     *'THE SIZE OF THE AREA SOURCE ARRAY(IA) IN INTERNAL UNITS (',I4,
     *',',I4,')'/1X,'NUMBER OF AREA SOURCE GRID IN USER UNITS'/1X,
     *I4,'MINIMUM',F8.3,5X,'MAXIMUM',F8.3,5X,'BIAS',
     *8A,3)
      WRITE(IO,501) Z,TIM,(NTS,M=,(NPM(I),I=1,NO.)
  501 FORMAT(' HEIGHT OF RECEPTOR',F8.3,5X,'TIME OF TRAVEL FOR
     *AREA INTERVAL(',
     *F10.4,' SECONDS)'/' NUMBER OF AREA HEIGHT CLASSES',I3,';  PERCENT
     *OF STACK HEIGHT WHICH IS PHYSICAL HEIGHT',F5.3/1X,
     *' HEIGHTS SEPARATING HEIGHT CLASSES',3(I3,F7.3))
      WRITE(IO,502) NMOUNS,NMISP,NSIGP,NSIGA
  502 FORMAT(' NUMBER OF HOURS STABILITY',I2,T30,'RECEPTOR SPACING FOR
     *MONTHLY/MB ARRAY(USER UNITS)',F7.3/1X,' # OF SIGNIFICANT POINT SO
     *URCES',I5,2X,' # OF SIGNIFICANT AREA SOURCES',I3///1X)
      WRITE(IO,503)
  503 FORMAT(1X,T8,'OPTION #',T18,'OPTION LIST',T46,'OPTION SPECIFICATI
     *ON',T80,'SIGNORE OPTIONS'/1X,T8,'10USE OPTION')
      WRITE(IO,504) (I,IOPT(I),I=1,10)
  504 FORMAT(1X,T7,I2,T16,'POINT SOURCE DATA'                ,T51,I1/1X,
     *        T7,I2,T16,'AREA SOURCE DATA'                   ,T51,I1/1X,
     *        T7,I2,T16,'PERMANENT RECEPTORS'                ,T51,I1/1X,
     *        T7,I2,T16,'SIGNIFICANT POINT RECEPTORS'        ,T51,I1/1X,
     *        T7,I2,T16,'SIGNIFICANT AREA RECEPTORS'         ,T51,I1/1X,
     *        T7,I2,T16,'MONTHLY RECEPTORS'                  ,T51,I1/1X,
     *        T7,I2,T16,'HOURLY OUTPUT'                      ,T51,I1/1X,
     *        T7,I2,T16,'PARTIAL RUNS, WRITTEN TO DISK'      ,T51,I1/1X,
     *        T7,I2,T16,'PRINT DAILY SUMMARY HOURLY OUTPUT',,T51,I1/1X,
     *        T7,I2,T16,'PUNCH CARDS FOR STATIONS'           ,T51,I1/1X)
      IF(NMOUNS.EQ.0) CALL EXIT
      IF(IOPT(1).EQ.0) GO TO 710
      WRITE(IO,505)
  505 FORMAT('1',T20,'POINT SOURCE INFORMATION'//1X,T2,'SOURCE',
     *T11,'EAST',T19,'NORTH',
     *T28,'DIAMETER',T38,'EXIT VELOCITY',T50,'EXIT TEMP',T60,'STACK
     *HEIGHT',T70,'EMISSION RATE'/1X,
     *T10,'(M)',T18,'(M)',T30,'(M)',T40,'(M/SEC)',T52,'(DEG K)',T62,'(M)
     *',T72,'(GRAMS/SEC)'/1X)
      MAXCNT=NSIZE+ISIZE
      DO 47 I=1,NPT
      CISOU=CE(I,1)+XU
      CZSOU=CE(I,2)+YU
      WRITE(IO,506) I,CISOU,CZSOU,(E(I,J),J=3,6),
     *(SIGMCE(M,I),M=7,MT)
      IPSIG=IPSIG
  46  FORMAT(1X,I5,1X,2F9.2,F10.2,F11.2,F12.2,6F11.4)
  47  CONTINUE
C***ALL IN SIGNIFICANT POINT SOURCE AREA
      DO 423 I=1,NSIGA
      JA=AS(I)
  423 IPSIG(JA)=I
```

```
  710 IF(IOPT(6).EQ.0) GO TO 720
      WRITE(IO,
  46  FORMAT('1',T2,'AREA SOURCE INFORMATION'//1X,
     *T2,'SOURCE',T10,'EAST',T18,'NORTH',T26,'LENGTH',T34,'WIDTH',T42,'
     *ORIENTATION',T54,'EMISSION RATE'/1X,
     *T29,'(M)',T37,'(M)',T45,'(DEG FROM NORTH)',T61,'(GRAMS/SEC)'/1X)
      DO 50 I=1,NAS
      CISAS=HC(I,1)+XU
      CZSAS=HC(I,2)+YU
      WRITE(IO,506) I,CISAS,CZSAS,(HC(I,J),J=3,5),AS=HC(I,1)
  49  FORMAT(1X,I3,1X,2F9.1,1X,1P11.3E2)
      IASIG=IPSIG
  50  CONTINUE
C***ALL IN SIGNIFICANT AREA SOURCE NUMBER ARRAY
      DO 424 I=1,NSIGA
      JA=AS(I)
  424 IASIG(JA)=I
  720 IF(IOPT(11).EQ.0) GO TO 730
      WRITE(IO,721)
  721 FORMAT(1A,'NO SOURCE SPECIFIED')
      CALL EXIT
C***INITIALIZATION
  730 DO 2730 ISTA=1,NSTA
      U(ISTA)=0.
      UE=X(ISTA)=0.
 2730 VEL=(ISTA)=0.
      I=NM=0
      WRITE(IO,
      WRITE(IO,
  47  FORMAT(' ',T2,'STA',T10,'X',T18,'Y',T26,'ELEV',T34,'TEMP',T42,'STABILITY'/
     *  1X,'METEOROLOGICAL DATA FOR EACH HOUR OF AVERAGING PERIOD
C***INPUT METDATA FOR EACH HOUR OF AVERAGING PERIOD
      DO 405 I=1,NHO
      READ(IN,506) (XST(J),J=1,3),TEMP(I)
  406 FORMAT(F8.2,F5.0,F10.1)
      WRITE(IO,410) I,(XST(J),J=1,3),TEMP(I),IAST(I)
  410 FORMAT(I5,12,2F4.0,F6.1,I3)
      AST=AST(I)
      DO 2406 ISTA=1,NSTA
      READ(IN,506) ISTA,ST=ETA(,STA,I),DU(ISTA,I)
      IF(ISTA.EQ.ISTA) GO TO 2405
      WRITE(IO,2404) ISTA
 2404 FORMAT('0',T11,'WIND DIRECTION AND WIND SPEED DATA FOR STATION NO.
     *',I2,' ARE OUT OF SEQUENCE.')
      STOP 1
 2405 THAJ=GTHETA(ISTA,I)*0.017453329
      SINTH=SIN(THAJ)
      COSTH=COS(THAJ)
C***CALCULATE WIND COMPONENTS
      IF(M(ISTA),GT.0.) DU(ISTA,I)=
     *  DU(ISTA,I)*(10./M(ISTA))**PO(AST)
      UE(ISTA)=DU(ISTA,I)
      UNE=UE(ISTA)*SINTH
      VNE=UE(ISTA)*COSTH
      VEL=(ISTA)=DU
```

```
      DELN(ISTA)=DELN(ISTA)+VN
 2408 U(ISTA)=U(ISTA)+UNES(ISTA)
      TEMP=TEMP+UTEMP(I)
  405 IFREQ(KST)=IFREQ(KST)+1                                          00001390
      WRITE(IO,2408)                                                   00001420
 2408 FORMAT('0',T11,'STATION NO.',T20,'HOUR',T41,'WIND DIRECTION',T61,
     X    'WIND SPEED',T75,'(DEG)',T83,'(M/S)'/)
C***CALCULATE RESULTANT  WIND DIRECTION THETA                          00001430
      DO 2417 ISTA=1,NSTA
      DELN(ISTA)=DELN(ISTA)/NHOURS
      DELM(ISTA)=DELM(ISTA)/NHOURS
      THETA(ISTA)=ANGARC(DELM(ISTA),DELN(ISTA))
C***CALCULATE AVERAGE AND RESULTANT SPEED                              00001470
      U(ISTA)=U(ISTA)/NHOURS
      URES(ISTA)=SQRT(DELN(ISTA)**2+DELM(ISTA)**2)
      PERSIS(ISTA)=URES(ISTA)/U(ISTA)
      I=1
      WRITE(IO,2418) CHARS(ISTA),I,QTHETA(ISTA,1),QU(ISTA,1)
 2417 IF(NHOURS.GT.1) WRITE(IO,2418) (BLANK,I,QTHETA(ISTA,I),QU(ISTA,I),
     X   I=2,NHOURS)
 2418 FORMAT(T10,A2,T27,I2,T42,F4.2,T60,F4.2)
      TEMP=TEMP/NHOURS
C***DETERMINE MODAL AND AVERAGE STABILITY                              00001490
      LSMAX=0                                                          00001520
      DO 407 I=1,7                                                     00001530
      LST=IFREQ(I)                                                     00001540
      IF(LST.LE.LSMAX) GO TO 407                                       00001550
      LSMAX=LST                                                        00001560
      LSTAB=I                                                          00001570
  407 CONTINUE                                                         00001580
      IF1=LSTAB+1                                                      00001590
      KST=LSTAB                                                        00001600
      DO 408 I=IP1,7                                                   00001610
      IF(LSMAX.EQ.IFREQ(I)) GO TO 411                                  00001620
  408 CONTINUE                                                         00001630
      GO TO 410                                                        00001640
C***IF TIE FOR MAX MODAL STABILITY CALCULATE AVERAGE STABILITY         00001650
  411 KSUM=0                                                           00001660
      DO 409 J=1,7                                                     00001670
  409 KSUM=KSUM+IFREQ(J)*J                                             00001680
      KST=FLOAT(KSUM)/FLOAT(NHOURS)+0.5                                00001690
C***OUTPUT RESULTANT MET CONDITIONS***                                 00001700
  410 WRITE(IO,419) TEMP,KST                                           00001710
  419 FORMAT('1RESULTANT MET CONDITIONS...'/'0',T21,'AVERAGE TEMP.=',
     X   F7.2,T51,'MODAL STABILITY=',I2/'0',T11,'STATION NO.',T20,
     X   'WIND DIRECTION',T46,'WIND SPEED',T61,'AVG. WIND SPEED',T81,
     X   'WIND RESISTANCE'/)
      DO 2420 ISTA=1,NSTA
      RES(1)=THETA(ISTA)
      RES(2)=URES(ISTA)
      RES(3)=U(ISTA)
      RES(4)=PERSIS(ISTA)
      DO 2419 K=1,4
 2419 RES2(K,ISTA)=RES(K)
      WRITE(IO,420) ISTA,RES



  420 FORMAT(T15,I2,T30,F7.2,T48,F7.2,T64,F7.2,T80,F6.3)
      IF(MULTI) GO TO 2420
      THAT=THETA(1)*0.01745329
      STAT=SIN(THAT)
      CUST=COS(THAT)
 2420 CONTINUE
      NRES=NSTA
C***INPUT PERMANENT RECEPTORS                                          00001740
      IF(IOPT(3).EQ.0) GO TO 740                                       00001870
  415 NRECEP=NRECEP+1                                                  00001880
      READ(IN,403) (NNAME(J,NRECEP),J=1,2),XREC(NRECEP),YREC(NRECEP)   00001890
  403 FORMAT(2A4,1X,2F10.3)                                            00001900
      XREC(NRECEP)=XREC(NRECEP)/UNITS                                  00001910
      YREC(NRECEP)=YREC(NRECEP)/UNITS                                  00001920
      IF(XREC(NRECEP).EQ.0) GO TO 416                                  00001930
      GO TO 415                                                        00001940
  416 NRELEP=NRECEP-1                                                  00001950
C***PRINT OUT TABLE OF PERMANENT RECEPTORS***                          00001960
      WRITE(IO,454)                                                    00001970
  454 FORMAT(1X////1X,T9,'INPUT RECEPTORS'//1X,
     *'RECEPTOR #  IDENTIFICATION     EAST      NORTH'/1X)            00001980
      DO 455 K=1,NRECEP                                                00001990
      ITYPE(K)=ICHAR                                                   00002000
      C1=XREC(K)*UNITS                                                 00002010
      C2=YREC(K)*UNITS                                                 00002020
      WRITE(IO,456) K,ITYPE(K),(NNAME(J,K),J=1,2),C1,C2                00002030
  456 FORMAT(1X,T4,I2,1X,A1,8X,2A4,7X,F6.2,3X,F7.2)                    00002040
  455 ICLOSE(K)=0                                                      00002050
C***DETERMINE RECEPTORS ACCORDING TO SIGNIFICANT SOURCES               00002060
  740 IF((IOPT(4)+ICPT(5)).EQ.0) GO TO 750                             00002070
      IF(MULTI) CALL UVCALC                                            00002080
      CALL JHMREC                                                      00002090
C***FILL IN RECEPTORS WITH HONEYCOMB ARRAY                             00002100
  750 IF(IOPT(6).EQ.0) GO TO 760                                       00002110
C***READ IN VARIABLE HONEYCOMB GRID DIMENSIONS                         00002120
      READ(IN,1056,END=311) HMMIN,HMMAX,HSMIN,HSMAX                    00002130
 1056 FORMAT(4F10.2)                                                   00002140
      IF(HMMAX.NE.0.0) GO TO 1056                                      00002150
  311 HMMIN=HMIN                                                       00002160
      HMMAX=HMAX                                                       00002170
      HSMIN=SMIN                                                       00002180
      HSMAX=SMAX                                                       00002190
 1056 CALL JHMMUN(GRIDSP)                                              00002200
  760 IF(NRECEP.NE.0)  GO TO 762                                       00002210
      WRITE(IO,761)                                                    00002220
  761 FORMAT(1X,'NO RECEPTORS HAVE BEEN CHOSEN')                       00002230
      CALL EXIT                                                        00002240
C***INITIALIZE CONCENTRATION SUMS                                      00002250
  762 DO 441 K=1,NRECEP                                                00002260
      ALHI(K)=0.0                                                      00002270
      PLMI(K)=0.0                                                      00002280
      DO 442 I=1,11                                                    00002290
  442 ASIGS(K,I)=0.0                                                   00002300
      DO 443 I=1,20                                                    00002310
  443 PSIGS(K,I)=0.0                                                   00002320
```

```
  441  CONTINUE                                                          00002340
C***LOOP ON HOURS                                                       00002350
       DO 440 LH=1,NHOURS                                               00002360
C***INITIALIZE HOURLY ARRAYS                                            00002370
       DO 453 K=1,NRELEP                                                00002380
       AHCM1(K)=0.0                                                     00002390
       PHCM1(K)=0.0                                                     00002400
       DO 451 I=1,11                                                    00002410
  451  AMBIGS(K,I)=0.0                                                  00002420
       DO 452 I=1,20                                                    00002430
  452  PMBIGS(K,I)=0.0                                                  00002440
  453  CONTINUE                                                         00002450
C***SET MET CONDITIONS FOR THIS HOUR***                                 00002460
       DO 2433 ISTA=1,NSTA
       THETA(ISTA)=QTHETA(ISTA,LH)
       U(ISTA)=QU(ISTA,LH)
C***DETERMINE WIND DIRECTION CONTROL, I=0                               00002520
       IF(MULTI) GO TO 2433
       DO 432 I=1,3                                                     00002530
       IF(THETA(I).LE.DEG(I)) GO TO 433
  432  CONTINUE                                                         00002550
       I=4                                                              00002560
  433  I=I
       THRAD=THETA(I)*0.01745329
       SINT=SIN(THRAD)
       COST=COS(THRAD)
 2433  CONTINUE
       HLOWML(LH)
       TEMP=TEMP(LH)                                                    00002490
       RST=RST(LH)                                                      00002500
       IF(MULTI.AND.IOPT(1)+IOPT(2).NE.0) CALL UVCALC                   00002510
C***CALCULATE AREA SOURCE CONTRIBUTIONS                                 00002610
       IF(IOPT(2).EQ.0) GO TO 770                                       00002620
C***SET UP INTEGRATION TABLES***                                        00002630
       IF(Z.EQ.0.0) GO TO 753                                           00002640
       CALL JHMAZ(HINT,Z,TLIM,NHTS)                                     00002650
       GO TO 751                                                        00002660
  753  CALL JHMANR(HINT,TLIM,NHTS)                                      00002670
  751  CALL JHMARE(NHTS,MAXINT)
C***CALCULATE POINT SOURCE CONTRIBUTIONS                                00002690
  770  IF(IOPT(1).EQ.0) GO TO 780                                       00002700
       IF(Z.EQ.0.0) GO TO 752                                           00002710
       CALL JHMPZ(HSAV,Z)                                               00002720
       GO TO 780                                                        00002730
  752  CALL JHMPAR(HSAV)                                                00002740
C***OUTPUT RESULTS EACH HOUR                                            00002750
  780  IF(IOPT(7).EQ.0) GO TO 440                                       00002760
       CALL JHMHOUT(LH)                                                 00002770
  440  CONTINUE                                                         00002780
C***OUTPUT FINAL RESULTS                                                00002790
  790  CALL JHMFIN(NRES2,KRES)
       STOP
       END                                                              00002810


       FUNCTION ANGANC(DELM,DELN)                                       00002820
C                          W. M. TUNNEY (AMRAD, CINCINNATI)             00002830
C        DETERMINES APPROPRIATE ANGLE OF TAN(ANG) = M/N,                00002840
C        NO COMMON REQUIREMENT, NO ARRAYS, USES LIBRARY FUNCTION ATAN2  00002850
       IF(DELN)1,2,3                                                    00002860
     1 IF(DELM)4,5,4                                                    00002870
     4 ANGANC = 57.2957804*ATAN2 (DELM/DELN)+180.                       00002880
       RETURN                                                           00002890
     5 ANGANC=180.                                                      00002900
       RETURN                                                           00002910
     2 IF(DELM)6,7,8                                                    00002920
     6 ANGANC=270.                                                      00002930
       RETURN                                                           00002940
     7 ANGANC = 0.                                                      00002950
       RETURN                                                           00002960
     8 ANGANC=090.                                                      00002970
       RETURN                                                           00002980
     3 IF(DELM)9,10,11                                                  00002990
     9 ANGANC = 57.2957804*ATAN2 (DELM/DELN)+360.                       00003000
       RETURN                                                           00003010
    10 ANGANC = 360.                                                    00003020
       RETURN                                                           00003030
    11 ANGANC = 57.2957804*ATAN2 (DELM/DELN)                            00003040
       RETURN                                                           00003050
C      ANGANC=360 INDICATES INDETERMINATE ANGLE                         00003060
       END                                                              00003070
```

```
      SUBROUTINE JMMANZ(MINI,TLIM,NMTS)                                  00006050
      COMMON  /SIGMA/CIN(3,240),AY(6,7),BY(6,7),AZ(6,7),BZ(6,7),TIME(5)  00006060
      DIMENSION JAY(42),JBY(42),JAZ(42),JBZ(42),MINI(3)                  00006070
      EQUIVALENCE (AY(1),JAY(1)),(BY(1),JBY(1)),
     X    (AZ(1),JAZ(1)),(BZ(1),JBZ(1))
      COMMON /METCON/ACHI(150),PCHI(150),ASIGB(150,11),PSIGB(150,26),    00006090
     *IASIGB(40),IPSIGB(177),KBT,HL,TEMP,BINT,CUBT,
     *THETA(50),U(50),HPM(2),IMD,NMAX,
     *PANIC(177),AMCHI(150),PMCHI(150),AMSIGB(150,11),PMSIGB(150,26)
      COMMON ITYPE(150),ICODE(150),IN,IO,NIP,NID,NHOURS,FM               00006120
C***ZERO CONCENTRATION ARRAY                                             00006130
      DO 400 IM=1,NMTS                                                   00006140
      MAXINI(IM)                                                         00006150
      DO 332 J=1,240                                                     00006160
  332 CIN(IM,J)=0.0                                                      00006170
      CP=0.                                                              00006180
      CI=0.                                                              00006190
      T=0.                                                               00006200
      NC=10                                                              00006210
      N=0                                                                00006220
      JO=1                                                               00006230
      IT=1                                                               00006240
      DELT=1.                                                            00006250
      JLD=1                                                              00006260
  312 CL=CP                                                              00006270
      T=T+DELT                                                           00006280
C                                                                        00006290
C***CALCULATE SIGMAS***                                                  00006300
C                                                                        00006310
      GO TO(2,503),JLD                                                   00006320
  503 DI=DELT*CP                                                         00006330
      GO TO 504                                                          00006340
    2 ISUB=IT+6*(KS(M-1)                                                 00006350
      SZ=AZ(ISUB)+T**BZ(ISUB)                                            00006360
      IF(SZ.GT.5000.)  SZ=5000.                                          00006370
      IF(M.LE.ML) GO TO 50                                               00006380
      CP=0.0                                                             00006390
      GO TO 500                                                          00006400
C***IF  STABLE CONDITIONS OR UNLIMITED MIXING HEIGHT USE Eq. 3.2         00006410
   50 IF(KS)=4) 401,401,403                                              00006420
  401 IF(ML.LT.5000.) GO TO 402                                          00006430
  403 A2=0.                                                              00006440
      C2=2.*SZ*SZ                                                        00006450
      C3=M*M/C2                                                          00006460
      IF(C3.LT.50.) A2=2./EXP(C3)                                        00006470
      CP=A2/(2.5000.*SZ)                                                 00006480
      GO TO 500                                                          00006490
C***IF SIGMA=Z IS GREATER THAN 1.6 TIMES THE MIXING HEIGHT               00006500
C***THE DISTRIBUTIONS BELOW THE MIXING HEIGHT IS UNIFORM WITH            00006510
C***HEIGHT REGARDLESS OF SOURCE HEIGHT.                                  00006520
  402 IF(SZ/ML-1.6) 405,405,404                                          00006530
  404 CP=1./ML                                                           00006540
      GO TO 500                                                          00006550
  405 A=0.                                                               00006560
      A1=0.39894/SZ                                                      00006570


      A2=0.                                                              00006580
      C2=2.*SZ*SZ                                                        00006590
      C3=M*M/C2                                                          00006600
      IF(C3.LT.50.) A2=2./EXP(C3)                                        00006610
  407 SUM=0.                                                             00006620
      TML=2.*ML                                                          00006630
  420 AN=AN+1.                                                           00006640
      A1=0.                                                              00006650
      A2=0.                                                              00006660
      C5=AN*TML                                                          00006670
      CL=M-C5                                                            00006680
      CP=M+C5                                                            00006690
      C6=CL*CL/C2                                                        00006700
      C8=CP*CP/C2                                                        00006710
      IF(C6.LT.50.) A1=2./EXP(C6)                                        00006720
      IF(C8.LT.50.) A2=2./EXP(C8)                                        00006730
      TOTAL=A1+A2                                                        00006740
      SUM=SUM+TOTAL                                                      00006750
      IF(TOTAL.LT.0.01) GO TO 412                                        00006760
      GO TO 420                                                          00006770
  412 CP=A1+(A2-SUM)                                                     00006780
  500 N=N+1                                                              00006790
      DI= 0.5 * DELT * (CL + CP)                                         00006800
  504 CI = CI + DI                                                       00006810
      GO TO(311,321,331,341,351,361,371,381),JO                          00006820
C***STORE CONC EVERY 10 SEC                                              00006830
  315 IT=T/10.+0.0000                                                    00006840
      CIN(IM,IT)=CI                                                      00006850
      N=0                                                                00006860
      GO TO 312                                                          00006870
  311 IF(T.GE.99.5) GO TO 314                                            00006880
C***T<100; STORE CONC EVERY 10, SECONDS                                  00006890
      N=N+1                                                              00006900
      IF(N-10) 312,315,315                                               00006910
C***T>100; INCREASE DELT; STORE CONC EVERY 100 SECONDS                   00006920
  314 JO=2                                                               00006930
      DELT=10.                                                           00006940
  313 IT=T/100.+ 9.08                                                    00006950
      CIN(IM,IT)=CI                                                      00006960
      N=0                                                                00006970
      GO TO 312                                                          00006980
  321 IF(T.LT.297.9) GO TO 322                                           00006990
C***T>=300; CHANGE SIGMA RANGE AND DELT                                  00007000
      IT=2                                                               00007010
      JO=3                                                               00007020
      DELT=50.                                                           00007030
      NC=2                                                               00007040
      GO TO 313                                                          00007050
  322 N=N+1                                                              00007060
      IF(N-NC) 312,313,313                                               00007070
  331 IF(T.LT.993.) GO TO 322                                            00007080
C***T>=1000; CHANGE SIGMA RANGE,DELT AND STORE CONC EVERY 1000 SECONDS   00007090
      JO=4                                                               00007100
      IT=3                                                               00007110
      DELT=500.                                                          00007120
```

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```
 342  IF(AT/1000. + 10.5
      CIV(IM,IFF)=CI
      GO
 343  GO TO(344,345),JUM
 344  IF(ABS(
C***N
      JUM=2
      GO TO 312
 345  IF(T.LT.6470.) GO TO 352
C***T>=3000; CHANGE SIGMA RANGE
      JUM=5
      IT=4
 352  N=N+1
      IF(N-2)312,342,342
 351  IF(T.LT.4470.) GO TO 352
C***T>=4000; CHANGE DELT
      JUM=
      DELT=1000.
      GO TO 342
 361  IF((T-4980.).LT.0.0) GO TO 342
C***T>=10,000; CHANGE SIGMA RANGE
      JUM=7
      IT=5
      GO TO 342
 371  IF(T.LT.29980.) GO TO 342
C***T>=30,000; CHANGE SIGMA RANGE
      JUM=
      IT=
      GO TO 342
 381  IF(T.LT.TLIM) GO TO 342
C***T>=TLIM; STORE LAST CALCULATED CONC
      IT=T/1000.+10.04
      CIV(IM,IT)=CI
 400  CONTINUE
      RETURN
      END


      SUBROUTINE JMAZ(MINT,Z,TLIM,NM1)
C
C***DISPERSION CHANGES FOR AREA SOURCES AND MIXING ZONE
      COMMON /SIGAZ/SZ(40),AY(6,7),BY(6,7),AZ(6,7),BZ(6,7),TIME(5)
      COMMON /METCON/ACM(150),PCM(150),ASIGS(150,11),PSIGS(150,26),
     *IASIGS(40),IPSIGS(177),AST,NL,TEMP,MINT,LUN1,
     *TMLTA(50),C(50),DF=(2),IOU,XMAX,
     *BAM(C(177),BMC=I(150),BMCM=I(150),AMSIGS(150,11),PMSIGS(150,26)
      COMMON IYPE(150),IC(150),IW,IU,IF,NIU,XMJUMS,FM
      DIMENSION ZAY(40),ABY(40),BAZ(40),BBZ(40),MINT(3)
      EQUIVALENCE (AY(1),ZAY(1)),(BY(1),BBY(1)),
     *   (AZ(1),BAZ(1)),(BZ(1),BBZ(1))
      DO 400 I=1,NM1
      XM1=I(I)
      ZM=BZ/M
      ZM=BZ/M
C***Z
 351
      M=1,
      CI=0.
      IW=
      NC=10
      M=0
      JUM=1
      IT=1
      DELTA=1.
      JUM=1
 317  CLOSE
      TAT=DELT
C
C***CALCULATE SIGMAS***
C
      GO TO(2,503),JUM
 503  DI=DELT*U
      GO TO 504
 2    IF(M=1)*0.5*(AST+1)
      SZ=BAZ(ISUB)+AA*MZ(ISUB)
      IF(SZ.GT.5000.)  SZ=5000.
      AM=0.
      IC=1
      I=ZZ,GT.M=1 I=M1-1
      IF(M=1.GT.1 I=M1-1
      GO TO(
403   WRITE(
403   FORMAT(1X,'SIGMA-Z EXCEEDS 5000 M. CALCULATIONS MUST BE PERFORMED WHEN BOTH Z AND M ARE
     *ABOVE THE MIXING HEIGHT')
      GO TO 400
50    AZ=0.
      AS=0.
      C2=2.*BZ*BZ
      C3=Z*M*Z-M/C2
      C4=Z*M+Z-M/C2
      IF(C3.LT.50.) AZ=1./EXP(C3)
      IF(C4.LT.50.) AS=1./EXP(C4)
```

```
C***IF STABLE CONDITIONS OR UNLIMITED MIXING HEIGHT USE EQ. 3.1                  00008020
      IF(K3)4) 404,404,405                                                      00008030
  404 IF(ML-5000.) 406,405,405                                                  00008040
  405 CP=(A2+A3)/(2.5000*BZ)                                                    00008050
      GO TO 500                                                                 00008060
C***IF SIGMAZ IS GREATER THAN 1.6 TIMES THE MIXING HEIGHT,                      00008070
C***THE DISTRIBUTION BELOW THE MIXING HEIGHT IS UNIFORM WITH                    00008080
C***HEIGHT REGARDLESS OF SOURCE HEIGHT.                                         00008090
  406 IF(BZ/ML-1.6) 407,407,408                                                 00008100
  408 CP=1./ML                                                                  00008110
      GO TO 500                                                                 00008120
  407 A1=0.398942/BZ                                                            00008130
      SUM=0.0                                                                   00008140
  120 ANBAN=1.                                                                  00008150
      A4=0.                                                                     00008160
      A5=0.                                                                     00008170
      A6=0.                                                                     00008180
      A7=0.                                                                     00008190
      C5=2.*ANAML                                                               00008200
      C4=(ZMM-C5)*(ZMM-CL)/C2                                                   00008210
      C7=(ZPM-C5)*(ZPM-CL)/C2                                                   00008220
      C8=(ZMM-C5)*(ZMM-C5)/C2                                                   00008230
      C9=(ZPM-C5)*(ZPM-C5)/C2                                                   00008240
      IF(C6.LT.50.) A4=1./EXP(C6)                                               00008250
      IF(C7.LT.50.) A5=1./EXP(C7)                                               00008260
      IF(C8.LT.50.) A6=1./EXP(C8)                                               00008270
      IF(C9.LT.50.) A7=1./EXP(C9)                                               00008280
      TOTAN = A4 + A5 + A6 + A7                                                 00008290
      SUM=SUM+TOT                                                               00008300
      IF(TOT - 0.01) 250,120,120                                                00008310
  250 CP=A1*(A2+A3+SUM)                                                         00008320
  500 CONTINUE                                                                  00008330
      ANANAN                                                                    00008340
      DI= 0.5 * DELT * (CL + CP)                                                00008350
  504 CI = CI + DI                                                              00008360
      GO TO(311,321,331,341,351,361,371,381),JD                                 00008370
C***STORE CONC EVERY 10 SECONDS                                                 00008380
  315 ITT=T/10.+.006                                                            00008390
      CIN(IM,ITT)=CI                                                            00008400
      NN=0                                                                      00008410
      GO TO 312                                                                 00008420
  311 IF(T.GE.99.8) GO TO 314                                                   00008430
C***T<100; STORE CONC EVERY 10. SECONDS                                         00008440
      NN=+1                                                                     00008450
      IF(N-10) 312,315,315                                                      00008460
C***T>100; INCREASE DELT; STORE CONC EVERY 100 SECONDS                          00008470
  314 JD=2                                                                      00008480
      DELT=10.                                                                  00008490
  315 ITT=T/100.+ 0.06                                                          00008500
      CIN(IM,ITT)=CI                                                            00008510
      NN=0                                                                      00008520
      GO TO 312                                                                 00008530
  321 IF(T.LT.297.4) GO TO 322                                                  00008540
C***T>=300; CHANGE SIGMA RANGE AND DELT                                         00008550
      ITT=2                                                                     00008560

      JD=3                                                                      00008570
      DELT=50.                                                                  00008580
      NL=2                                                                      00008590
      GO TO 315                                                                 00008600
  322 NN=1                                                                      00008610
      IF(N-NL) 312,315,315                                                      00008620
  331 IF(T.LT.993.) GO TO 322                                                   00008630
C***T>=1000; CHANGE SIGMA RANGE,DELT AND STORE CONC EVERY 1000 SECONDS         00008640
      JD=4                                                                      00008650
      ITT=3                                                                     00008660
      DELT=500.                                                                 00008670
  342 ITT=T/1000. + 10.08                                                       00008680
      CIN(IM,ITT)=CI                                                            00008690
      NN=0                                                                      00008700
  343 GO TO(344,312),JLD                                                        00008710
  344 IF((ABS(CP-CL))/CP),GT.0.0001) GO TO 312                                  00008720
C***NO LONGER NEED TO CALCULATE DI, USE A CONSTANT VALUE                        00008730
      JLD=2                                                                     00008740
      GO TO 312                                                                 00008750
  341 IF(T.LT.2979.) GO TO 352                                                  00008760
C***T>=3000; CHANGE SIGMA RANGE                                                 00008770
      JD=5                                                                      00008780
      ITT=4                                                                     00008790
  352 NN=1                                                                      00008800
      IF(N-2)312,342,342                                                        00008810
  351 IF(T.LT.4979.) GO TO 352                                                  00008820
C***T>=5000; CHANGE DELT                                                        00008830
      JD=6                                                                      00008840
      DELT=1000.                                                                00008850
      GO TO 342                                                                 00008860
  361 IF(T.LT.9980.) GO TO 342                                                  00008870
C***T>=10,000; CHANGE SIGMA RANGE                                               00008880
      JD=7                                                                      00008890
      ITT=5                                                                     00008900
      GO TO 342                                                                 00008910
  371 IF(T.LT.29880.) GO TO 342                                                 00008920
C***T>=30,000; CHANGE SIGMA RANGE                                               00008930
      JD=8                                                                      00008940
      ITT=6                                                                     00008950
      GO TO 342                                                                 00008960
  381 IF(T.LT.TLIM) GO TO 382                                                   00008970
C***T>=TLIM; STORE LAST CALCULATED CONC                                         00008980
      ITT=T/1000.+10.09                                                         00008990
      CIN(IM,ITT)=CI                                                            00009000
  400 CONTINUE                                                                  00009010
      RETURN                                                                    00009020
      END                                                                       00009030
```

```
      SUBROUTINE JMNREC                                                 00003080
C***DETERMINE RECEPTORS AND# SIGNIFICANT SOURCES                        00003090
      COMMON /CUEPPS/CCUEP(7,8),CEXP(7,8),TCOEP(7,8),TEXP(7,8),         00003100
     *AYCOP(7,5),ATEXP(7,5)                                             00003110
      COMMON /METCON/ACMI(150),PCMI(150),ABIGS(150,11),PBIGB(150,26),   00003120
     *IA$I=8(40),IPSIGS(177),XST,ML,TEMP,SINT,COST,
     *ALPHA(50),UA(50),BPH(2),I=0,NMAX,
     *PARTC(177),AMCH=I(150),PMCH=I(150),AMBIGS(150,11),PMBIGB(150,26)
      COMMON /SOMC/IA(25,25),SOURCE(8,177),ASURC(8,46),                 00003150
     *UNITS,CONVRM,NREC(150),SREC(150),MPS(25),=AB(10),ICPT(10),IPOL,   00003160
     *NRECEP,XMIN,XMAX,SMIN,SMAX,IMSIZE,ISSIZE,NPT,NAS,NBIGP,NBIGA,CONVM
      LOGICAL MULTI
      COMMON /PTS/ PX(50),PY(50),HT(50),NSTA,MULTI
      COMMON ITYPE(150),ICOUR(190),IN,IU,NIP,NID,NHOURS,PM
      DIMENSION MC1(9),MC2(9)                                           00003180
      DATA MC1/10,,20,,50,,70,,100,,200,,300,,500,,1000,/,              00003190
     *MC2/10,, 30,, 50,, 100,/,ICHAR/'P'/,JCHAR/'A'/                    00003200
      EQUIVALENCE (JA(1),JU)                                            00003210
      IF(IOPT(1),EQ,0) GO TO 700                                        00003220
C***LOOP ON SIGNIFICANT POINT SOURCES                                   00003230
      WRITE(IU,310)                                                     00003240
  310 FORMAT(1H1////1X,79,'SIGNIFICANT POINT RECEPTONS'///1X,           00003250
     *'RECEPTON #  EAST       NORTH      PREDICTED MAX CONC,'/1X)       00003260
      DO 300 IP=1,NSIGP                                                 00003270
      X=0,0                                                             00003280
      IBMP3(IP)                                                         00003290
      MSBSOURCE(1,I)                                                    00003300
      SSBSOURCE(2,I)                                                    00003310
      WRSOURCE(IP),I)                                                   00003320
C***CALCULATE PLUME RISE                                                00003330
      IF(.NOT.MULTI) GO TO 9
      CALL RPIE(D(MS,SS,WU,U)
      X=0,
    9 CALL JMNFRS(M,WU,SOURCE(5,I),SOURCE(6,I),SOURCE(8,I),SOURCE(7,I),
     **ST,UU,S,TEMP)                                                    00003350
C***DETERMINE HEIGHT CLASS *                                            00003360
      DO 10 I=2,M                                                       00003370
      IF(HU*(MC1(I-1),GT) GO TO 11                                      00003380
   10 CONTINUE                                                          00003390
      I=M9                                                              00003400
   11 IS=I-1                                                            00003410
C***CALCULATE X TIME & DISTANCE TO MAX AND MAX CONCENTRATION            00003420
      IF(.NOT.(XST*E,0,.AND.,IS,EQ,0)) GO TO 306                        00003430
      WRITE(IU,307)                                                     00003440
  307 FORMAT(' X AND XU ARE NOT VALID IN THIS HEIGHT CLASS WHEN STABIL  00003450
     *ITY IS 7')                                                        00003460
      CALL EXIT                                                         00003470
  306 XRCOEP(XST,IS)                                                    00003480
      HRCEXP(XST,IS)                                                    00003490
      CONMAX=0,                                                         00003500
      XRTCOEP(XST,IS)                                                   00003510
      XRTEXP(XST,IS)                                                    00003520
      TRCON=0,                                                          00003530
      XRCNTCEP
      W,0=0
      S,0=0
      IF(.NOT.MULTI) GO TO 301
      THETA=0,
      J=3
C***DETERMINE RECEPTOR COORDINATES AT X AND 2X                          00003580
  301 DO 302 J=1,2
      XRC=J
      ITYPE(K)=ICHAR
      ICOUR(K)=I                                                        00003600
      IF(.NOT.MULTI) GO TO 305                                          00003610
      DO 303 ITHETA=1,NMAX
      XRT,XRCOS(C,NUM
      THETA=THETA0,017453*J*
  304 CALL RPIE(UU,NMAXSIN(THETA),SNMAXCOS(THETA),THETA,U)
      THETA=THETA0,017453*
      SINT=SIN(THETA)
      COST=COS(THETA)
  305 XRC=I
      XREC(K)=XRC*XSINT/CONUM
      SREC(K)=XRC*XCOST/CONUM
      IF(J,EQ,2) GO TO 320
      WSBREC(K)
      SSBSREC(K)
      IF(MULTI) CALL RPIE(WU,SU,THETA,U)
  320 CIBREC(K)=CONITS
      CSBSREC(K)=CONITS                                                 00003650
  300 WRITE(IU,311) K,ICHAR,I,C1,C2,CUNM
  311 FORMAT(1X,I3,I2,1A,A1,1S,S3,F7,2,2X,F8,2,4X,E12,4)                00003670
C***INCREMENT NUMBER OF RECEPTONS                                       00003690
      NRECEP=NRECEP+2                                                   00003700
  302 CONTINUE                                                          00003710
C***LOOP ON SIGNIFICANT AREA SOURCES                                    00003720
  700 IF(IOPT(2),EQ,0) GO TO 710                                        00003730
      WRITE(IU,312)                                                     00003740
  312 FORMAT(1H1////1X,79,'SIGNIFICANT AREA SOURCE RECEPTONS'///1X,     00003750
     *'RECEPTON #  EAST       NORTH      '///1X)                       00003760
      DO 308 IP=1,NSIGA                                                 00003770
      I=NAS(IP)                                                         00003780
      XRASBREC(5,I)=0,5
      WSBASBREC(1,I)=X
      SSBASBREC(2,I)=X
      WRASOURCE(M,I)                                                    00003800
C***DETERMINE HEIGHT CLASS                                              00003810
      DO 308 I=2,3                                                      00003820
      IF(M,LT,MC2(I-1)=0,01) GO TO 309                                  00003830
  308 CONTINUE                                                          00003840
      I=10                                                              00003850
  309 IS=I-1                                                            00003860
C***CALCULATE TIME TO MAX                                               00003870
      CRATCOP(XST,IS)                                                   00003880
      URATEXP(XST,IS)                                                   00003890
      TRCON=0                                                           00003900
      IF(.NOT.MULTI) GO TO 314                                          00003910
      THETA=0                                                           00003920
      JRLS
```

```
      DO 313 ITEM=1,NMAX
      THAD=METAD*0.01745329
      SINT=SIN(THAD)
      COST=COS(THAD)
      AA=0.5*(U+TIME/CONUM+SQRT((U-TIME/CONUM)**2+4.*(U*TIME/CONUM)))
  313 CALL MPIELD(MB=AA*SINT,BB=AA*COST,THETA,U)
      THAD=METAD*0.01745329
      SINT=SIN(THAD)
      COST=COS(THAD)
  314 ABSAB=ABS(AA/COST)
      BBSAB=ABS(AA/SINT)                                              00003940
      ABSAMIN1(A,B)                                                   00003950
      RDUST=ABS(CONUM
      NRECEP=NRECEP+1                                                 00003980
      XREC(NRECEP)=XB=AA*SINT/CONUM
      YREC(NRECEP)=YB=AA*COST/CONUM
      C1=XREC(NRECEP)-UNITS                                           00004010
      C2=YREC(NRECEP)-UNITS                                           00004020
      WRITE(10,311) NRECEP,JCHAR,I,C1,C2                              00004030
      ITYPE(NRECEP)=JCHAR                                             00004040
      ICODE(NRECEP)=I                                                 00004050
      IF(NRECEP.LT.150) GO TO 302                                     00004060
      WRITE(10,800)                                                   00004070
  800 FORMAT(' THE MAXIMUM NO. OF RECEPTORS HAS BEEN GENERATED'/1X,   00004080
     *' NO OTHERS WILL BE ACCEPTED')                                  00004090
  302 CONTINUE                                                        00004100
  710 RETURN                                                          00004110
      END                                                             00004120
```

```
      SUBROUTINE DMPRNS(HP,HE,HP,TS,VS,D,ASTBLE,T)                    00004130
C***                                                                  00004140
C     THIS SUBROUTINE IS A MODIFICATION OF BLM072                     00004150
C          OUTPUT VARIABLES ARE...                                    00004160
C            HP    FINAL EFFECTIVE PLUME HEIGHT (METERS)             00004170
C            HX    EFFECTIVE PLUME HEIGHT AT DISTANCE X (METERS)     00004180
C            DELHP FINAL PLUME RISE (METERS)                         00004190
C          INPUT VARIABLES ARE...                                    00004200
C            HB    PHYSICAL STACK HEIGHT (METERS)                    00004210
C            TS    STACK GAS TEMPERATURE (DEG K)                     00004220
C            VS    STACK GAS EXIT VELOCITY (M/SEC)                   00004230
C            D     INSIDE STACK DIAMETER (METERS)                    00004240
C            ASTBLE STABILITY (CLASS), SEE PAGE 209 OF PASQUILL      00004250
C                  ATMOSPHERIC DISPERSION.  CLASSES DEFINED BY...    00004260
C                    1 IS PASQUILL STABILITY CLASS A                 00004270
C                    2 IS PASQUILL STABILITY CLASS B                 00004280
C                    3 IS PASQUILL STABILITY CLASS C                 00004290
C                    4 IS PASQUILL STABILITY CLASS D                 00004300
C                    5 IS PASQUILL STABILITY CLASS E                 00004310
C                    6 IS PASQUILL STABILITY CLASS F                 00004320
C            U     WIND SPEED (M/SEC)                                00004330
C            X     DOWNWIND DISTANCE (M)                             00004340
C            DTHDZ POTENTIAL TEMPERATURE LAPSE RATE (DEG K/METER)    00004350
C            T     AMBIENT AIR TEMPERATURE (DEG K)                   00004360
      IF(T)1,1,2                                                      00004370
C       T = 0. MEANS NO AMBIENT TEMPERATURE GIVEN,  USE T = 293,      00004380
    1 T = 293.                                                        00004390
    2 P = 980.                                                        00004400
    5 VP = 0.785398*VS*D**2                                           00004410
C       THE CONSTANT 0.785398 = PI/4                                  00004420
    6 F = 3.12159*VP*(TS-T)/TS                                        00004430
C       THE CONSTANT 3.12159 IS THE ACCELERATION DUE TO GRAVITY / PI. 00004440
      GO TO (7,7,7,7,20,20,20),ASTBLE                                 00004450
C       DETERMINE APPROPRIATE FORMULA FOR CALCULATING XST, DISTANCE AT 00004460
C         WHICH TURBULENCE BEGINS TO DOMINATE.  THE FORMULA USED DEPENDS00004470
C         UPON BUOYANCY FLUX.  STATEMENTS 8 AND 9 ARE EQUATION (7).   00004480
    7 IF(F-55.)8,9,9                                                  00004490
    8 XST=14.*F**.625                                                 00004500
      GO TO 10                                                        00004510
    9 XST=34.*F**.4                                                   00004520
   10 DISTF=3.5*XST                                                   00004530
      DELHP=1.6*F**0.333333*DISTF**0.666667/U                         00004540
      IF(X)29,29,32                                                   00004550
C       IF X = 0.0, CALCULATE FINAL RISE ONLY, IF X IS GREATER THAN   00004560
C         0.0, CALCULATE RISE FOR DISTANCE = X ALSO.                  00004570
   32 XM = 1000.* X                                                   00004580
C       XM IS X IN METERS.                                            00004590
C       STATEMENT 14 IS EQUATION (6), REFERENCE 1.                    00004600
   14 DELMX = 1.6*F**0.333333*XM**0.666667/U                          00004610
      IF(DELMX.GT.DELHP)DELMX=DELHP                                   00004620
      GO TO 30                                                        00004630
   20 GO TO (7,7,7,7,22,23,23),ASTBLE                                 00004640
   22 DTHDZ = 0.02                                                    00004650
      GO TO 24                                                        00004660
   23 DTHDZ = 0.035                                                   00004670
```

```
      R= 9.80616*SYMBOL
C           THE CONSTANT 9.80616 IS THE ACCELERATION DUE TO GRAVITY,
C           S IS A STABILITY PARAMETER,
C           CALCULATE PLUME RISE ACCORDING TO EQUATION (4), REFERENCE 1,
      DHA = 2.4*(F/(U*S))**0.333333
C           CALCULATE PLUME RISE BY EQUATION (5), REFERENCE 1 FOR LIGHT
C             WIND CONDITIONS ACCORDING TO MORTON, TAYLOR, AND TURNER,
      DELHF = 5.0*F**0.25/S**0.375
      IF(DHA-DELHF) 25,25,27
   25 DELHF = DHA
C           DISTANCE TO FINAL PLUME RISE IS GIVEN BY THE FOLLOWING
   27 DISTF = 3.1415926*U/S**0.5
C           IF X = 0.0, CALCULATE FINAL RISE ONLY, IF X IS GREATER THAN
C             0.0, CALCULATE RISE FOR DISTANCE = X ALSO,
C           IF X IS ZERO OR LESS, GO TO 29 AND SET PLUME RISE AND DIST, TO
C             MAXIMUM PLUME RISE EQUAL TO ZERO,
      IF(X)29,29,33
   33 XM=1000.*X
C           XM IS X IN METERS,
C           IF XM IS GREATER THAN THE DISTANCE TO THE POINT OF FINAL PLUME
C             RISE, SET PLUME RISE EQUAL TO FINAL PLUME RISE, OTHERWISE,
C             CALCULATE PLUME RISE FROM EQUATION (6),REFERENCE 1,
      IF(XM-DISTF)31,31,28
   28 DELHX = DELHF
      GO TO 30
   29 DELHX = 0.
      HX = 0.
      GO TO 32
C           CALCULATE EFFECTIVE HEIGHT AT DISTANCE X,
   30 HX = HP + DELHX
C           CALCULATE FINAL EFFECTIVE HEIGHT,
   31 HP = HP + DELHP
      DISTP = DISTF/1000.
      HEIGHT=HP
      END
```

```
      SUBROUTINE ZMAXSIG(SIGZ,SP)
C***GENERATES IN SP MINIMUM MEDIAN SIGMAS***
      COMMON /SPEC/ZA(25,25),SIGMEL(8,177),ASIGEL(4,4),
     *UNITS,CON,XM,SAFE(150),SMLT(150),SMPS(25),MAS(10),IOPT(10),IPOL,
     *NRECEP,XMIN,XMAX,SMIN,SMAX,IMSIZE,ISSIZE,SAT,SAS,NSIGP,NSIGA,ISNU*
      COMMON /MET/CON/AL(-1:150),PCM(150),ASIG(15,11),BSIG(15,26),
     *IASIG(4,6),IBSIG(177),MAT,MAS,MAX,
     *MAXL(177),AML(-1:15),BMC(-1:150),AMSIG(15,11),BMSIG(15,26)
      COMMON ITYPE(150),ICLOP(150),IX,IY,IP,NI,NUMS,M
      DIMENSION SIGZ(150),SP(150),SIGMAS(150),ASIG(3)
      DATA ICMAX/0/
C***INITIALIZE MAXIMUM SIGMAS***
      DO 10 I=1,NUMS
      SIGMAS(I)=0.0
   10 CONTINUE
      DO 20 I=1,NI
      ASIG(I)=0.0
   20 CONTINUE
      DO 50 I=1,NUMS
      IF(ICLOP(I).EQ.0) GO TO 50
      IF(ITYPE(I).EQ.ICMAX) GO TO 40
      ICMAX=ITYPE(I)
      DO 30 J=1,NI
      ASIG(J)=ASIG(J)+ASIGEL(ICMAX,J)
   30 CONTINUE
   40 SIGMAS(I)=ASIG(IP)*SP(I)
   50 CONTINUE
C***ELIMINATE MULTIPLE RECEPTORS THAT ARE CLOSE TO OTHER RECEPTORS
      DO 60 I=1,NRECEP
      SP(I)=SIGMAS(I)
C***IS RECEPTOR WITHIN AREA SOURCE LIMITS
      IF((X(I).GT.XMIN).OR.(X(I).GT.XMAX)) GO TO 60
      IF((Y(I).LT.YMIN).OR.(Y(I).GT.YMAX)) GO TO 60
```

```
      DLIM = XINC * XINC
      XDUM = (S - XMIN)/XINC + 1.
      IXDU = XDU (XDUM,2)
      XDUMA = XDUM/2
      MMDU = IXDU + 1
      GO TO (510,520), MMDU
  510 XDUMB = (XMMMIN)/XINCSP
      GO TO 530
  520 XDUMB = (X - XMIN + XINC)/XINCSP
  530 ISUB = XDUMA + (NCOLS1 + NCOLS2) + IXDU + NCOLS1 + XDUMB
      XDUMC(1) = ISUB
      XDUMC(2) = ISUB + 1
      GO TO (550,560),MMDU
  550 XDUMC(3) = ISUB + NCOLS2+1
      GO TO 570
  560 XDUMC(3) = ISUB + NCOLS1
  570 DO 650 K = 1,3
      ISUB = XDUMC(K)
      DIST=(XMMCOMM(ISUB))**2+(S-COMBS(ISUB))**2
C***  DISTANCE BETWEEN RECEPTOR AND MONEYCOMB POINT IS LESS THAN
C***    XSMALLDSP THEN IGNORE MONEYCOMB POINT
      IF(DIST.GE.DLIM) GO TO 650
      RCOMM(ISUB)=1.0
  650 CONTINUE
  660 CONTINUE
C***ADD REMAINING MONEYCOMB POINTS TO RECEPTOR ARRAYS
      WRITE(IU,512)
  512 FORMAT(//1X,79('MONEYCOMB RECEPTORS'//1X,
     *'RECEPTOR # EAST      NORTH'/1X)
      DO 655 ISUB=1,NBEES
      IF(RCOMM(ISUB)) 655,654,655
  654 NRECEP=NRECEP+1
      XREC(NRECEP)=XCOMM(ISUB)
      SREC(NRECEP)=COMBS(ISUB)
      ITYPE(NRECEP)=ICHAR
      IGRE(NRECEP)=0
      CIMMP(NRECEP)=CNITS
      CPOLREC(NRECEP)=CNITS
      WRITE(IU,511) NRECEP,ICHAR,CI,C2
  511 FORMAT(1X,I5,13,1A,A1,4A,F8.2,3A,F7.2)
      IF(NRECEP.LT.1500) GO TO 655
      WRITE(IU,600)
  600 FORMAT(' THE MAXIMUM NO. OF RECEPTORS HAS BEEN GENERATED'/1X,
     *' NO OTHERS WILL BE ACCEPTED.')
      RETURN
  655 CONTINUE
  700 RETURN
      END
```

```
      SUBROUTINE JMAIN(NEB,NNES)                                          00015150
      COMMON /METCON/ALMI(150),PCMI(150),ASIGB(150,11),PSIGB(150,20),     00015160
     *IASIGS(40),IPSIGS(177),XBT,ML,TEMP,SINT,COBT,
     *THETA(50),U(50),UPM(2),IWU,NMAX,
     *PANIC(177),AMGMI(150),PMCMI(150),AMBIGB(150,11),PMBIGB(150,20)
      COMMON /SUML/IA(25,25),SOURCE(8,177),ASORC(8,40),                   00015190
     *UNITS,CONVRM,XNEC(150),BNEC(150),MPS(25),MAB(10),IOPT(10),IPOL,    00015200
     *NNECEP,NMIN,NMAX,SMIN,SMAX,INSIZE,ISSIZE,NPT,NAB,NSIGP,NSIGA,CONVM
      COMMON /METDAT/ STHETA(50,24),UU(50,24),INSI(24),UML(24),UTEMP(24)
      LOGICAL MULTI
      COMMON /PTS/ PX(50),PY(50),PT(50),NSTA,MULTI
      COMMON ITYPE(150),ICODE(150),IN,IC,NIP,NID,NHOURS,PM
     1IMENSION GMANDT(150),IMANK(150),GMANDS(150),MES(4,50),IPOLT(2)      00015230
C***AVERAGE CONCENTRATIONS OVER SPECIFIED TIME PERIOD                     00015240
      DATA IPOLT/'SO2 ','PART'/                                           00015250
      INTEGER*2 CHARS(50)/' 1',' 2',' 3',' 4',' 5',' 6',' 7',' 8',' 9',  00015260
     *   '10','11','12','13','14','15','16','17','18','19','20','21',
     *   '22','23','24','25','26','27','28','29','30','31','32','33',
     *   '34','35','36','37','38','39','40','41','42','43','44','45',
     *   '46','47','48','49','50'/,BLANK/' '/
      IPOLU=IPOLT(1)
      IF(IPOL.EQ.4) IPOLU=IPOLT(2)                                        00015270
      DO 2 K=1,NNECEP                                                     00015280
      ALMI(K)=AMGMI(K)/NHOURS                                             00015290
      PCMI(K)=PMCMI(K)/NHOURS                                             00015300
      GMANDI(K)=ALMI(K)*PCMI(K)                                           00015310
      GMANDS(K)=GMANDT(K)                                                 00015320
      DO 3 I=1,11                                                         00015330
    3 ASIGS(K,I)=ASIGB(K,I)/NHOURS                                        00015340
      DO 4 I=1,20                                                         00015350
    4 PSIGS(K,I)=PSIGB(K,I)/NHOURS                                        00015360
    2 CONTINUE                                                            00015370
C***                                                                      00015380
C***WRITE POINT SOURCE TABLE                                              00015390
      IF(IOPT(1),EQ.0) GO TO 200                                          00015400
      WRITE(IU,10)  IPOLU                                                 00015410
   10 FORMAT('1',T30,'AVERAGE ',A4,' CONTRIBUTION(G/CU. M) FROM SIGNIFICA00015420
     *ANT POINT SOURCES'//1X,15,'RANK')                                   00015430
      IF(NSIGP.GT.10) GO TO 100                                           00015440
C***PRINT FIRST PAGE OF OUTPUT AND TOTALS                                 00015450
      WRITE(IU,11) (I,I=1,NSIGP)                                          00015460
   11 FORMAT('0',T12,10(I3,7X))                                           00015470
      WRITE(IU,12)                                                        00015480
   12 FORMAT('0',T113,'TOTAL     TOTAL'/1X,T113,'SIGNIF    ALL POINT'/1X00015490
     1,T113,'POINT     SOURCES'/1X,'SOURCE #')                           00015500
      WRITE(IU,13) (MPS(I),I=1,NSIGP)                                     00015510
   13 FORMAT('0',T12,10(I3,7X))                                           00015520
      WRITE(IU,14)                                                        00015530
   14 FORMAT(1X,'RECEP #')                                                00015540
      DO 15 K=1,NNECEP                                                    00015550
      WRITE(IU,16) K,(PSIGS(K,I),I=1,NSIGP)                               00015560
   16 FORMAT(1X,T3,I3,5X,IP10E10.3)                                       00015570
C***PRINT TOTALS***                                                       00015580
      WRITE(IU,18)  PSIGS(K,20),PCMI(K)                                   00015590
   18 FORMAT('0',T112,1PE10.3)                                            00015600
                                                                          00015610


   15 CONTINUE                                                            00015620
      GO TO 200                                                           00015630
C***PRINT FIRST PAGE                                                      00015640
  100 WRITE(IU,11) (I,I=1,10)                                             00015650
      WRITE(IU,17) (MPS(I),I=1,10)                                        00015660
   17 FORMAT(1X,'SOURCE #',T12,10(I3,7X))                                 00015670
      WRITE(IU,14)                                                        00015680
      DO 31 K=1,NNECEP                                                    00015690
   31 WRITE(IU,16) K,(PSIGS(K,I),I=1,10)                                  00015700
      IF(NSIGP.GT.20) GO TO 150                                           00015710
C***PRINT SECOND PAGE AND TOTALS                                          00015720
      WRITE(IU,10)                                                        00015730
      WRITE(IU,11) (I,I=11,NSIGP)                                         00015740
      WRITE(IU,12)                                                        00015750
      WRITE(IU,13) (MPS(I),I=11,NSIGP)                                    00015760
      WRITE(IU,14)                                                        00015770
      DO 19 K=1,NNECEP                                                    00015780
      WRITE(IU,16) K,(PSIGS(K,I),I=11,NSIGP)                              00015790
   19 WRITE(IU,18)  PSIGS(K,20),PCMI(K)                                   00015800
      GO TO 200                                                           00015810
C***WRITE SECOND PAGE***                                                  00015820
  150 WRITE(IU,10)                                                        00015830
      WRITE(IU,11) (I,I=11,20)                                            00015840
      WRITE(IU,17) (MPS(I),I=11,20)                                       00015850
      WRITE(IU,14)                                                        00015860
      WRITE(IU,16) K,(PSIGS(K,I),I=11,20)                                 00015870
      WRITE(IU,10)                                                        00015880
C***WRITE LAST PAGE AND TOTALS***                                         00015890
      WRITE(IU,11) (I,I=21,NSIGP)                                         00015900
      WRITE(IU,12)                                                        00015910
      WRITE(IU,13) (MPS(I),I=21,NSIGP)                                    00015920
      WRITE(IU,14)                                                        00015930
      DO 20 K=1,NNECEP                                                    00015940
      WRITE(IU,16) K,(PSIGS(K,I),I=21,NSIGP)                              00015950
   20 WRITE(IU,18) PSIGS(K,20),PCMI(K)                                    00015960
C***                                                                      00015970
C***WRITE AREA SOURCE TABLE                                               00015980
  200 IF(IOPT(2),EQ.0) GO TO 810                                          00015990
      WRITE(IU,21) IPOLU                                                  00016000
   21 FORMAT('1',T30,'AVERAGE ',A4,' CONTRIBUTION(G/CU. M) FROM SIGNIFIC00016010
     *ANT AREA SOURCES'//1X,T5,'RANK')                                    00016020
      WRITE(IU,11) (I,I=1,NSIGA)                                          00016030
      WRITE(IU,22)                                                        00016040
   22 FORMAT('0',T113,'TOTAL     TOTAL'/1X,T113,'SIGNIF    ALL AREA'/1X,00016050
     1T113,'AREA      SOURCES'/1X,'SOURCE #')                            00016060
      WRITE(IU,13) (MAS(I),I=1,NSIGA)                                     00016070
      WRITE(IU,14)                                                        00016080
      DO 23 K=1,NNECEP                                                    00016090
      WRITE(IU,16) K,(ASIGS(K,I),I=1,NSIGA)                               00016100
   23 WRITE(IU,18) ASIGS(K,11),ALMI(K)                                    00016110
C***OUTPUT SUMMARY TABLE                                                  00016120
  810 WRITE(IU,24) NHOURS,IPOLU                                           00016130
   24 FORMAT('1',T25,I2,'-HOUR AVERAGE ',A4,' SUMMARY CONCENTRATION TABL00016140
     *E'/1X)                                                              00016150
      WRITE(IU,99)
```

```
   40 FORMAT(' HOUR  MIXING     TEMP     STABILITY'/T9,'HEIGHT(M)  (K)',
     *  '        CLASS'/)
      WRITE(IO,43) (I,HML(I),HTEMP(I),IHST(I),I=1,NHOURS)
   43 FORMAT(T3,I2,2F9.2,6X,I1)
      WRITE(IO,44)
   44 FORMAT('0',T11,'STATION NO.',T26,'HOUR',T41,'WIND DIRECTION',T61,
     *  'WIND SPEED'/T45,'(DEG)',T63,'(M/S)'/)
      DO 45 ISTA=1,NSTA
      I=1
      WRITE(IO,46) CHARS(ISTA),I,STHETA(ISTA,I),SU(ISTA,I)
   45 IF(NHOURS.GT.1) WRITE(IO,46) (BLANK,I,STHETA(ISTA,I),SU(ISTA,I),
     *  I=2,NHOURS)
   46 FORMAT(T16,A2,T27,I2,T42,F9.2,T60,F9.2)
      WRITE(IO,47) TEMP,KST
   47 FORMAT('1RESULTANT MET CONDITIONS...'/'0',T21,'AVERAGE TEMP,K',
     *  F7.2,T51,'MODAL STABILITY=',I2/'0',T11,'STATION NO.',T26,
     *  'WIND DIRECTION',T46,'WIND SPEED',T61,'AVG. WIND SPEED',T81,
     *  'WIND PERSISTANCE'/)
      DO 48 ISTA=1,NSTA
   48 WRITE(IO,49) ISTA,(RES(K,ISTA),K=1,4)
   49 FORMAT(T15,I2,T30,F7.2,T48,F7.2,T64,F7.2,T86,F6.3)
      WRITE(IO,25)
 25   FORMAT(1X,//1X,'RECEPTOR NO.   EAST      NORTH     ',2X,
     *5('TOTAL FROM   '),'CONCENTRATION'/1X,
     1T36,'SIGNIF POINT  ALL POINT   SIGNIF AREA   ALL AREA   ALL SOURCE
     2S',4X,'RANK'/1X,T38,4('SOURCES',6X)/1X)
C***CALCULATE GRAND TOTALS AND RANK CONCENTRATIONS
      DO 28 I=1,NRECEP
      CMAX=-1.0
      DO 27 K=1,NRECEP
      IF(GRANDT(K).LE.CMAX) GO TO 27
      CMAX=GRANDT(K)
      L=K
 27   CONTINUE
      IRANK(L)=I
      GRANDT(L)=-1.0
 28   CONTINUE
      DO 29 K=1,NRECEP
      C1=XREC(K)*UNITS
      C2=YREC(K)*UNITS
      WRITE(IO,30) K,ITYPE(K),ICODE(K),C1,C2,PSIGS(K,26),
     *PCHI(K),ASIGS(K,11),ACHI(K),GRANDS(K),IRANK(K)
 30   FORMAT(1X,T3,I3,1X,A1,I3,6X,F7.2,2X,F7.2,1X,1P5E13.4,4X,I3)
 29   CONTINUE
      IF(IOPT(10).EQ.0) RETURN
      DO 32 K=1,NRECEP
      C1=XREC(K)*UNITS
      C2=YREC(K)*UNITS
      GJMHOU=GRANDS(K)*1.0E+06
      AJMHOU=ACHI(K)*1.0E+06
      PJMHOU=PCHI(K)*1.0E+06
      WRITE(7,818) C1,C2,GJMHOU,AJMHOU,PJMHOU,K
 818  FORMAT('CNTL',1X,5F10.3,I4)
 32   CONTINUE
      RETURN
      END

      SUBROUTINE [illegible]
C***C [illegible] AREA SOURCES***
      COMMON [illegible](25,25),SOURCE(6,177),ASORC(6,60),
     *[illegible](25),RAS(10),IOPT(10),IPOL,
     *[illegible],IRSIZE,ISSIZE,NPT,NAS,NSIGP,NSIGA,CONCM
      COMMON [illegible](ACHI(150),PCHI(150),ASIGS(150,11),PSIGS(150,26),
     *IAXIGS(60),IPSIGS(177),KST,HL,TEMP,SINT,COST,
     *ALPHA(50),U(50),RPM(2),IXO,NMAX,
     *PARTC(177),AMCHI(150),PMCHI(150),AMSIGS(150,11),PMSIGS(150,26)
      LOGICAL MULTI
      COMMON /[illegible]/ [illegible](50),[illegible](50),[illegible](50),NDTA,MULTI
      COMMON ITYPE(150),ICODE(150),IX,IY,KIR,NIO,NHOURS,FM
      DIMENSION RX(5),[illegible](4),AUELS(4)
      DATA AUELR/0.00005,0.00005,-0.00005,-0.00005/
      DATA AUELS/0.00005,-0.00005,-0.00005,0.00005/
      EQUIVALENCE (ALPHA(1),THETA),(UA(1),U)
      R[illegible]=RMIN+SIGN(0.00005,RMIN)
      S[illegible]=SMIN+SIGN(0.00005,SMIN)
      IRMIN=IFIX(RMIN)+1
      ISMIN=IFIX(SMIN)+1
C***
C***LOOP ON RECEPTORS
C***
      DO 503 K=1,NRECEP
      DO 619 I=1,NAS
 619  PARTC(I)=0.0
      T=0.
      TL=0.0
      CONCL=0.0
      IHL=0
      IGCNT=0
      X=XREC(K)
      Y=YREC(K)
      IF(MULTI) CALL WFIELD(X,Y,HU,HS)
      IR=IFIX(X+0.00005)
      IS=IFIX(Y+0.00005)
C***  IS RECEPTOR WITHIN DEFINED LIMITS ***
      IF((X.LE.RMIN).OR.(X.GE.RMAX)) GO TO 800
      IF((Y.LE.SMIN).OR.(Y.GE.SMAX)) GO TO 800
C***
C***DETERMINE SOURCE NUMBER,NS, SOURCE CENTER(RC,SC),
C***SOURCE LENGTH,AA, SOURCE STRENGTH,QA, AND SOURCE HEIGHT,HA
C***
      XX=X
      YY=Y
 614  IR=IR-IRMIN
      IS=IS-ISMIN
      IF((IR.LE.0).OR.(IR.GT.IRSIZE)) GO TO 505
      IF((IS.LE.0).OR.(IS.GT.ISSIZE)) GO TO 505
      IGCNT=IGCNT+1
      NS=IA(IR,IS)
      IF(NS.EQ.0) GO TO 618
      AA=ASORC(5,NS)
      D=0.5*AA
      RC=ASORC(1,NS)+D
```

```
      SUBROUTINE (Z,NB)0
      COMMON/CTPUL/NB
      COMMON/(B,NB)
C     ,ANY HEIGHT ACCTNOING TO WIND SPEED
      IF(FM.LE.2.,GO1) GO TO 510
      IF(MULTI) CALL MFIELD(C,SC,THETA,J)
      R=TEMP=A
      MAX(1=A=FM=1=A,1)/UEFM=1
C     DETERMINE HEIGHT CLASS
  510 I=A=M=13
      GO TO (605,702,703),NMTB
  703 IF(MA.LT.AMM(2)) I=A2
  709 IF(MA.LT.AMM(1)) I=A1
      GO TO 605
C     CORRECTION IS ON VALUE LIMITS OF UNIFORM
  A20 USMIN(1,E10
      I=1=0
      A=B=I=
C     FIND CLOUD FOR WHICH THEN AMAX
      DO A05 L=1,2
      W=B=M=A
      IF(.NOT.MULTI) GO TO A01
      =D10=U
      =S10=D
      AAA,S=(A=W=1
      DO 799 ITE=B1,NMAX
      THAUR=U1=0,01/=53=9
      $B7=W=CU3(THAU1/SI(.(THA2)=Y
  799 CALL MFIR(.(1RA,,,5=(Y=3),=U1,=B1)
      THAUR=U1=0,01/=53=9
      SINT=SIN(=HAU
      CUST=CUS(THAU)
  A01 $B=W=A=CU3'/SI(T=
      IF(J.GT.3=AX) GO TO A03
      IF(S.LT.5=IN) GO TO A03
      UAR=W=SINT=(1=3=Y=C.S1
      IF(U=) A03,B02,B02
  A02 IF(U=,GE,.U=M(1) GO TO A03
      =.U=B=M
      SLOLAB
      U=I=B=A
      IF(.NOT.MULTI) GO TO 79M
      THETAR=U1
      =B=S1
   79M IC=T=I(=T=1
  A03  W=B=M=AA
  A05  CONTINUE
C     FIND CLOUD FOR WHICH THEN AMAX
      S=B=M=1=
      DO A07 L=5,=
      S=S=D=W=
      IF(.NOT.MULTI) GO TO A04
      =.I=A=U
      =.I=A=D
      TTA,S=(Y=5=)



      DO A=M I(=B1,=MAX
      THAUR=U1=0,01/=53=9
      =B=5=S(=(THA)/CUS(=A)=A
  A08 CALL MFIL(U1,S=(A=M),TT=M=1,=B1)
      THAUR=U1=0,01/=53=9
      SINT=SIN(=HAU)
      CUST=CUS(THAU)
  A09 AA5=D=S=T=/CUST=A
      IF(M=.GT.=M=1) GO TO A06
      IF(M=.LT.=M=1) GO TO A08
      UAR(=M=A)=SIN(=S=3=CUST
      IF(UA) A08,A05,A05
  A06 IF(U=,GE,.5=M(1) GO TO A06
      =.I=A=
      SLOLAB=
      UA=I=B=A
      IF(.NOT.MULTI) GO TO A10
      THETAR=U1
      =B=S1
  A10 IC=T=I(=T=1
  A06  S=B=M=AA
  A07 CONTINUE
C     IF IC=1=0 NO CLOUD ABOVE FOUND
      IF(ICNT.E=.0) GO TO 595
  A20  USISUAM1=
C     FIND THE TIME TO THE NEAREST SOURCE IN AN
C     FINDING COORDINATES TO LOCATE SOURCE
      TLBDIST=CO.=A=U
      TA1=
      IF(.NOT.=ULTI) GO TO A21
      CALL MFIELD(=HLOC,SLOC,=U,=3)
      CALL DECTOR(THETA,I=D)
  A21 A=B=LOLA=DELH(I=2)
      YY=SLOC=A=DELS(I=2)
      I=B=X
      I=B=Y
      GO TO 614
  615  UB,5
      HLB(=M=1=B=D
      SLB(SNT=0)=D
C     FIND CLOUD OF SPECIFIED WAY AND CLOSEST BOUNDER
  A05 IF(.NOT.=ULTI) GO TO 607
      THETAB=U
      DO A01 I(=B1,=MAX
      CALL DECTOR(THETA,I=D)
      CALL COORDS(HL,SC,0,I=D,=B,S0)
      TRAUR(META=0,01/=5329
      SINT=SIN(TRAD)
      CUS(=CUS(TRAD)
      XU1=(HB=X=)/SI(T
      XU2=(S0=Y=)/C)ST
      IF(XU1.LT,=02) GO TO 600
      MUU=X=X=2=31.T
      S0,=S0
      GO TO 601
```

```
  600 XX(J)=XX
      SUM=XY*SI(J)+C(J)
  601 CALL XFIELD(I,S*(XX+SUM),,S*(YY+SUM),THETA,J)
      THETA=THETA+0.3174532E
      SINTH=SIN(THAD)
      COSTH=COS(THAD)
      CALL DECOMP(THETA,IND)
  607 CALL COORDS(XC,YC,D,IND,XB,YB)
      XU1=(XB-XX)*SINT
      XU2=(YB-YY)/COST
      IF(XU1.LT.400) GO TO 610                                          00010280
      XU1=XU1+400*SINT
      SUM=YB
      DIST=XU2
      GO TO 611                                                         00010320
  610 XU1=XU1
      SUM=YY+XU1*COST
      DIST=XU1
  611 XX=XU1*A2EL*(I+J)
      YY=SUM+A2EL*(I+J)
      TOTDIST=DIST/C
      IF(NS.EQ.0) GO TO 620                                             00010370
      IF(DIST.LE.10.0E+10) GO TO 920                                    00010380
      CALL INTPOL(T,IM,CONC)                                            00010390
C***USE THIS TIME AND WEIGHT CLASS TO GET VALUE FOR                     00010400
C*** INTERPOLATED A/G TO THIS TRAVEL TIME BY INTERPOLATING IN TABLE     00010410
      IF(TL.LE.0.) GO TO 612
      IF(IM.NE.IM1) CALL INTPOL(TL,IM,CONC1)                            00010430
  612 DIFF=CONC-CONC1                                                   00010440
      IF(DIFF.LE.0.) GO TO 505
      FRAC=DIST*P                                                       00010450
      AL=I(K)*AC=I(K,FRAC)                                              00010460
      AM=I(K)*AM=I(K)*FRAC                                              00010470
      ASIG=ASIG(NS)                                                     00010480
      IF(NDIM.EQ.0) GO TO 710                                           00010490
C***IF SOURCE IS SIGNIFICANT, STORE PARTIAL CONCENTRATION               00010500
      ASIG(K,NSIG)=ASIG(K,NSIG)+FRAC                                    00010510
      AMSIG(K,NSIG)=AMSIG(K,NSIG)+FRAC                                  00010520
      ASIG(K,11)=ASIG(K,11)+FRAC                                        00010530
      AMSIG(K,11)=AMSIG(K,11)+FRAC                                      00010540
  710 CONTINUE                                                          00010550
C***SAVE PARTIAL CONCENTRATION FOR ALL SOURCES                          00010560
      PART(NS)=FRAC                                                     00010570
      IML=IM                                                            00010580
      GO TO 913                                                         00010590
  920 IML=0                                                             00010600
  913 CONT                                                              00010610
C***IS THIS POINT OUTSIDE OF THE SOURCE REGION OR
C           HAS A RING BARRIER BEEN ENCOUNTERED?
      IF(XX.LE.XMIN.OR.XX.GE.XMAX.OR.YY.LE.YMIN.OR.YY.GE.YMAX
     &   .OR.IACNT.GT.MAXCNT) GO TO 505
C***IF,IS IN INDICES FOR NEXT SOURCE                                    00010650
      IF(MULTI) CALL XFIELD(XB,YY,+0,+S)
      IMAX
      ISAVY


      GO TO 610
C*****PUT PARTIAL CONCENTRATIONS TO DISK                                00010680
  505 IF(SUMY(8),EQ.0) GO TO 503                                        00010690
      WRITE(NIP,715) K,PART                                             00010700
  715 FORMAT(I9,1PE12.4)                                                00010710
  503 CONTINUE                                                          00010720
      RETURN                                                            00010730
      END                                                               00010740
                                                                        00010750
```

```
BLOCK DATA
COMMON /CLEAR/CLEAR(7,8),CLEARM(7,8),TCLEAR(7,8),TLAM(7,8),
*ATCLR(7,8),ATEAM(7,8)
COMMON /STUMAP/CINES(7,8),AT(6,7),ST(6,7),AZ(6,7),RZ(6,7),T1=E(7)
DATA CLEAR/ 2.900E+02, 6.900E+02, 1.082E+03, 1.851E+03,
* 1.955E+03, 1.705E+03, 1.200E+03, 6.917E+02, 8.412E+02,
* 1.005E+03, 1.055E+03, 1.450E+03, 1.704E+03, 1.952E+03,
* 2.910E+03, 2.147E+03, 1.083E+03, 1.836E+03, 1.965E+03,
* 2.154E+03, 2.065E+03, 1.913E+03, 1.839E+03, 1.965E+03,
* 2.045E+03, 1.957E+03, 1.788E+03, 1.757E+03, 1.965E+03,
* 1.947E+03, 2.724E+03, 2.984E+03, 3.491E+03, 2.917E+03,
* 2.195E+03, 2.113E+03, 1.983E+03, 3.528E+03, 7.270E+03,
* 3.597E+03, 2.220E+03, 5.810E+02, 1.143E+03, 2.538E+03,
* 1.254E+03, 5.180E+03, 5.072E+03, 1.043E+03, 5.810E+03,
* 8.812E+02, 3.547E+03, 2.254E+03, 5.802E+01, 9.888E+03,
* 2.043E+03, 3.957E+02, 0.000E+00, 0.283E+01, 0.838E+03,
* 3.947E+03, 5.414E+03 /
DATA CLEAR/
*-2.785E+00,-2.121E+00,-1.781E+00,-1.898E+00,-2.980E+00,
*-2.117E+00,-2.068E+00,-2.157E+00,-2.079E+00,-2.121E+00,-2.157E+00,
*-1.448E+00,-2.068E+00,-2.079E+00,-2.121E+00,-2.157E+00,
*-2.149E+00,-1.732E+00,-1.897E+00,-2.001E+00,-2.079E+00,
*-2.122E+00,-2.068E+00,-2.079E+00,-1.732E+00,-1.897E+00,
*-2.121E+00,-2.084E+00,-2.201E+00,-2.296E+00,-2.553E+00,
*-1.734E+00,-1.884E+00,-2.011E+00,-1.884E+00,-2.255E+00,
*-2.103E+00,-2.744E+00,-1.677E+00,-1.877E+00,-2.013E+00,
*-2.139E+00,-2.495E+00,-2.787E+00,-3.442E+00,-1.000E+00,
*-1.877E+00,-1.987E+00,-2.600E+00,-2.540E+00,-3.077E+00,
*-5.171E+00,-1.000E+00,-1.947E+00,-1.953E+00,-2.497E+00,
*-2.785E+00,-1.744E+00,-1.873E+00,-1.873E+00 /
DATA ICLEAR/ 2.195E 00, 2.175E 00, 1.898E 00, 1.347E 00,
* 1.994E 00, 1.871E 00, 1.817E 00, 1.553E 00, 1.917E 00,
* 1.747E 00, 1.905E 00, 1.804E 00, 1.604E 00, 2.751E 00,
* 1.943E 00, 1.991E 00, 1.855E 00, 1.462E 00, 1.883E 00,
* 1.891E 00, 1.823E 00, 1.723E 00, 1.923E 00, 1.781E 00,
* 1.855E 00, 1.851E 00, 1.171E 00, 1.889E 00, 3.147E 00,
* 1.962E 00, 1.782E 00, 1.643E 00, 1.294E 00, 9.981E-01,
* 1.713E 00, 3.231E 00, 1.171E 00, 1.557E 00, 1.342E 00,
* 1.147E 00, 3.131E 00, 9.283E-01, 1.859E 00, 2.190E 00,
* 1.947E 00, 1.320E 00, 1.304E-01, 1.324E 00, 4.704E-02,
* 4.919E 00, 2.993E 00, 1.001E 00, 9.915E-01, 5.467E-02,
* 8.614E-02, 2.000E 00 /
DATA ICLEA/
*-2.053E-01, 4.083E-01, 1.180E 00,
* 1.215E 00, 1.054E 00, 1.313E 00, 1.313E 00, 8.480E-01,
* 1.724E 00, 1.852E 00, 1.179E 00, 1.271E 00, 1.329E 00,
* 1.267E 00, 9.044E 00, 1.360E-01, 1.17E 00, 1.180E 00,
* 1.219E 00, 1.093E 00, 1.044E 00, 1.306E-01, 1.180E 00,
* 1.153E 00, 1.134E 00, 1.332E 00, 1.467E 00, 1.340E 00,
* 8.243E-01, 1.000E 00, 1.097E 00, 1.193E 00, 1.285E 00,
* 1.334E 00, 1.880E 00, 8.222E-01, 9.789E-01, 1.090E 00,
* 1.018E 00, 1.444E 00, 1.559E 00, 2.000E 00, 7.000E-01,
* 9.793E-01, 1.119E 00, 1.399E 00, 1.709E 00, 1.805E 00,
* 2.197E 00, 7.000E-01, 1.000E 00, 1.000E 00, 1.443E 00,
* 1.000E 00, 2.000E 00,
DATA ATC/ 3.456E 00, 4.780E 00, 4.457E 00, 4.457E 00,
* 2.457E 00, 2.457E 00,
* 2.807E 00, 2.592E 00, 3.454E 00, 3.454E 00, 2.119E 00,
* 1.999E 00, 2.911E 00, 3.873E 00, 2.083E 00, 8.762E-01,
* 1.792E 00, 1.792E 00, 1.792E 00, 1.792E 00, 1.792E 00,
* 1.792E 00, 1.792E 00,
DATA ATCLR/ 3.5E 00, 1.479E 00, 1.687E 00, 8.407E-01,
* 5.000E-01, 5.000E-01,
DATA ATEAM/ 1.000E 00, 1.000E 00, 1.000E 00, 1.000E 00,
* 1.000E 00, 1.000E 00,
* 1.194E 00, 1.514E 00, 1.201E 00, 8.570E-01,
* 1.671E 00, 1.150E 00, 1.116E 00, 1.131E 00, 1.313E 00,
* 1.733E 00, 8.063E-01, 9.775E-01, 1.157E 00, 1.057E 00,
* 1.425E 00, 1.750E 00, 2.000E 00,
DATA ITME/5000., 1000., 500., 1000., 500.,
1 4*2.1E-5, 2.0E-5, 1.9E-5, 1.8E-5, 2.502E-5, 2.502E-5,
2 1.E-01, 1.E-01, 1.527E7, 1.527E7, 1.965E5, 1.965E5,
3 0.E-01, 0.E-01, 1.E-5, 1.252E-4, 1.624E-4, 1.624E-4,
4 1.E-13, 0.E-15, 1.E-5, 0.E-1, 1.677E5, 0.677E5,
5 0.E-10, 0.E-9, 1.E-5, 0.E-5, 1.E-5, 0.E-5,
6 0.E-10, 0.E-9, 1.E-5, 0.E-5, 1.E-5, 0.E-5,
7 1.E-10, 0.E-9, 1.E-5, 0.E-5, 1.E-5, 0.E-5,
DATA BTC/ 0.870E-1, 0.870E-1, 1.E-5, 0.E-5, 0.E-12,
2 0.E-1, 0.E-1, 0.E-12, 0.E-12, 0.E-12,
3 0.E-1, 0.E-1, 1.E-5, 1.E-5, 2.875E6,
4 0.E-1, 0.E-1, 1.E-5, 1.E-5, 2.E-5,
5 0.E-1, 0.E-1, 1.E-5, 1.E-5, 2.E-5,
6 0.E-1, 0.E-1, 1.E-5, 1.E-5, 2.E-5,
7 0.E-1, 0.E-1, 1.E-5, 1.E-5, 2.E-5,
DATA BTE/ 0.10E-1, 0.1E-1, 0.1E-1, 5000.0, 5000.0, 5000.0,
2 0.1E-1, 0.1E-1, 0.1E-1, 5000.0, 5000.0,
3 0.1E-1, 0.1E-1, 0.1E-1, 5000.0, 5000.0,
4 0.1E-1, 0.1E-1, 0.1E-1, 5000.0, 5000.0,
5 0.1E-1, 0.1E-1, 0.1E-1, 5000.0, 5000.0,
6 0.1E-1, 0.1E-1, 0.1E-1, 5000.0, 5000.0,
7 0.1E-1, 0.1E-1, 0.1E-1, 5000.0, 5000.0,
DATA BTC/ 1.18E-1, 1.30E-1, 1.58E-4, 1.5E-4, 2.0E-5,
2 1.0, 1.02E-5, 1.1E-5, 1.E-5, 0.0E-5,
3 0.92E-5, 0.91E-4, 0.42E-5, 0.42E-5, 0.0E-5, 0.0,
4 0.4E-12, 0.83E-5, 0.7E-11, 0.05E-5, 0.02E-5, 0.53E-5,
5 0.78E-5, 0.73E-5, 0.59E-5, 0.53E-5, 0.47E-5, 0.37E-5,
6 0.76E-5, 0.8E-5, 0.5E-5, 0.4E-5, 0.29E-5, 0.19E-5,
7 0.76E-5, 0.5E-5, 0.4E-5, 0.3E-5, 0.2E-5, 0.1E-5,
END
```

HEIGHT ABOVE 100M FOR POINT SOURCE # 1
TEST CASE URBAN AREA; 5 POINT SOURCES, 7 AREA SOURCES

POINT SOURCE INFORMATION

SOURCE	EAST CO-ORD (USER UNITS)	NORTH CO-ORD (USER UNITS)	SO2(G/SEC) EMISSIONS	PART(G/SEC) EMISSIONS	STACK HT(M)	STACK TEMP(K)	STACK DIAM(M)	STACK VEL(M/SEC)	SIGNIFICANCE VALUE
1	12,50	7,50	4987,50	0,0	200,0	400,0	5,0	20,0	0,7621E+03
2	7,50	12,50	997,50	0,0	100,0	400,0	5,0	15,0	0,2571E+03
3	7,50	2,50	997,50	0,0	100,0	400,0	5,0	15,0	0,2571E+03
4	7,50	7,50	997,50	0,0	100,0	400,0	5,0	15,0	0,2571E+03
5	2,50	7,50	199,50	0,0	50,0	400,0	5,0	10,0	0,8865E+04

AREA SOURCE INFORMATION

SOURCE	EAST CO-ORD (USER UNITS)	NORTH CO-ORD (USER UNITS)	SO2 EMISSIONS (GRAMS/SQ, M/SEC)	PART EMISSIONS	SIDE LENGTH (USER UNITS)	EFFECTIVE HEIGHT (METERS)	SIGNIFICANCE VALUE
1	0,0	11,0	3,9375E+07	0,0	4,0	0,0	1,5750E+03
2	5,0	8,0	3,9375E+06	0,0	2,0	15,0	7,8750E+03
3	8,0	8,0	3,9375E+06	0,0	2,0	20,0	7,8750E+03
4	5,0	5,0	3,9375E+06	0,0	2,0	15,0	7,8750E+03
5	8,0	5,0	3,9375E+06	0,0	2,0	20,0	7,8750E+03
6	7,0	7,0	3,9900E+05	0,0	1,0	25,0	3,9900E+02
7	0,0	0,0	3,9375E+07	0,0	4,0	0,0	1,5750E+03
8	1,0	4,0	0,0	0,0	2,0	0,0	0,0
9	3,0	4,0	0,0	0,0	2,0	0,0	0,0
10	5,0	10,0	0,0	0,0	5,0	0,0	0,0
11	5,0	0,0	0,0	0,0	5,0	0,0	0,0
12	10,0	10,0	0,0	0,0	5,0	0,0	0,0
13	10,0	5,0	0,0	0,0	5,0	0,0	0,0
14	10,0	0,0	0,0	0,0	5,0	0,0	0,0

THE ORIGIN IN INTERNAL UNITS IS(0, 0)
THE SIZE OF THE AREA SOURCE ARRAY IS (15, 15)
RMIN= 0,0 RMAX= 15,00 SMIN= 0,0 SMAX= 15,00

TOTAL EMISSION AND CUMULATIVE FRACTION ACCORDING TO HEIGHT

HEIGHT(M)	TOTAL POINT EMISSIONS(G/S)	CUMULATIVE FRACTION	TOTAL AREA EMISSIONS(G/S)	CUMULATIVE FRACTION
0 = 5	0,0	0,0	12,60	0,109
6 = 10	0,0	0,0	0,0	0,109
11 = 15	0,0	0,0	31,50	0,382
16 = 20	0,0	0,0	31,50	0,655
21 = 25	0,0	0,0	39,90	1,000
26 = 30	0,0	0,0	0,0	1,000
31 = 35	0,0	0,0	0,0	1,000
36 = 40	0,0	0,0	0,0	1,000
41 = 45	0,0	0,0	0,0	1,000
46 = 50	199,50	0,015	0,0	1,000
51 = 55	0,0	0,015	0,0	1,000
56 = 60	0,0	0,015	0,0	1,000
61 = 65	0,0	0,015	0,0	1,000
66 = 70	0,0	0,015	0,0	1,000
71 = 75	0,0	0,015	0,0	1,000
76 = 80	0,0	0,015	0,0	1,000
81 = 85	0,0	0,015	0,0	1,000
86 = 90	0,0	0,015	0,0	1,000
91 = 95	0,0	0,015	0,0	1,000
96 =100	2992,50	0,242	0,0	1,000
TOTAL	13167,00		115,50	

SIGNIFICANT SO2 POINT SOURCES

RANK	QMAX/U	SOURCE NO,
1	7,6213E+04	1
2	2,5705E+04	2
3	2,5705E+04	3
4	2,5705E+04	4
5	8,8655E+03	5

SIGNIFICANT SO2 AREA SOURCES

RANK	Q*LENGTH	SOURCE NO,
1	3,9900E+02	6
2	7,8750E+03	2
3	7,8750E+03	3
4	7,8750E+03	8
5	7,8750E+03	9
6	1,5750E+03	1
7	1,5750E+03	7

PARAMETERS

MULTI-STATION TEST CASE

ORIGIN: (0.0 , 0.0)

WEIGHTING GRID NX= 1 WEIGHTING GRID NY= 1

WEIGHTING GRID GX= 1.00 WEIGHTING GRID GY= 1.00

NO WEIGHTING FACTORS (Y) POWER= 2.0

SEARCH ANGLE= 45.0

STATIONS

RAPS NETWORK - ST. LOUIS

STATION NO.	X	Y	WEIGHT	IDENTIFICATION
1	7.41	6.95	0.0	
2	7.17	7.95	0.0	
3	7.98	7.35	0.0	
4	7.91	6.51	0.0	
5	7.32	6.39	0.0	
6	6.51	6.60	0.0	
7	6.78	7.41	0.0	
8	8.16	8.75	0.0	
9	9.29	6.89	0.0	
10	7.88	5.79	0.0	
11	6.51	5.78	0.0	
12	5.76	7.16	0.0	
13	6.87	8.58	0.0	
14	7.53	9.80	0.0	
15	9.36	9.60	0.0	
16	10.47	8.51	0.0	
17	10.02	5.72	0.0	
18	7.16	4.26	0.0	
19	5.04	5.51	0.0	
20	4.04	8.03	0.0	
21	5.63	10.65	0.0	
22	7.31	15.00	0.0	
23	12.77	7.83	0.0	
24	8.07	0.0	0.0	
25	0.0	7.55	0.0	

RAM

TRAM INPUT

NUMBER OF ITERATIONS USED IN COMPUTING TRAVEL DISTANCE IS 1

THE NUMBER OF USER UNITS PER MINIMUM GRID SQUARE= 0.1000E 01
CONVERSION FACTOR:USER UNITS TO KILOMETERS= 0.1000E 01
THE SIZE OF THE AREA SOURCE ARRAY(IA) IN INTERNAL UNITS (15, 15)
BOUNDARIES OF AREA SOURCE GRID IN USER UNITS:
RMIN= 0.0 RMAX= 15.000 SMIN= 0.0 SMAX= 15.000
HEIGHT OF RECEPTORS= 0.0 LIMIT OF TRAVEL TIME FOR AREA INTEGRATION 22000. SECONDS
NUMBER OF AREA HEIGHT CLASSES= 3; PERCENT OF STACK HEIGHT WHICH IS PHYSICAL HEIGHT=0.500
HEIGHTS SEPARATING HEIGHT CLASSES 21.000 31.000
NUMBER OF HOURS SIMULATED= 5 RECEPTOR SPACING FOR HONEYCOMB ARRAY(USER UNITS)= 3.000
OF SIGNIFICANT POINT SOURCES= 5 # OF SIGNIFICANT AREA SOURCES= 7

OPTION #	OPTION LIST	OPTION SPECIFICATION: 0=IGNORE OPTION 1=USE OPTION
1	POINT SOURCE DATA	1
2	AREA SOURCE DATA	1
3	PERMANENT RECEPTORS	1
4	SIGNIFICANT POINT RECEPTORS	1
5	SIGNIFICANT AREA RECEPTORS	1
6	HONEYCOMB RECEPTORS	1
7	HOURLY OUTPUT	1
8	PARTIAL CONC. WRITTEN TO DISK	0
9	PRINT ONLY SUMMARY HOURLY OUTPUT	0
10	PUNCH CARDS FOR CONTOURS	0

POINT SOURCE INFORMATION

SOURCE	EAST CO-ORD	NORTH CO-ORD	SO2(G/SEC) EMISSIONS	PART(G/SEC) EMISSIONS	STACK HT(M)	STACK TEMP(K)	STACK DIAM(M)	STACK VEL(M/SEC)
1	12.50	7.50	4987.50	0.0	200.0	400.0	5.0	20.0
2	7.50	12.50	997.50	0.0	100.0	400.0	5.0	15.0
3	7.50	2.50	997.50	0.0	100.0	400.0	5.0	15.0
4	7.50	7.50	997.50	0.0	100.0	400.0	5.0	15.0
5	2.50	7.50	199.50	0.0	50.0	400.0	5.0	10.0

AREA SOURCE INFORMATION

SOURCE	EAST CO-ORD	NORTH CO-ORD	SO2(G/SEC-M**2) EMISSIONS	PART(G/SEC-M**2) EMISSIONS	SIDE LENGTH	EFFECTIVE HEIGHT
1	0.0	11.0	3.9375E-07	0.0	4.0	0.0
2	3.0	8.0	3.9375E-06	0.0	2.0	15.0
3	8.0	8.0	3.9375E-06	0.0	2.0	20.0
4	5.0	5.0	3.9375E-06	0.0	2.0	15.0
5	8.0	5.0	3.9375E-06	0.0	2.0	20.0
6	7.0	7.0	3.9900E-05	0.0	1.0	25.0
7	0.0	0.0	3.9375E-07	0.0	4.0	0.0
8	1.0	4.0	0.0	0.0	2.0	0.0
9	3.0	4.0	0.0	0.0	2.0	0.0
10	5.0	10.0	0.0	0.0	5.0	0.0
11	9.0	0.0	0.0	0.0	5.0	0.0
12	10.0	10.0	0.0	0.0	5.0	0.0
13	10.0	5.0	0.0	0.0	5.0	0.0
14	10.0	0.0	0.0	0.0	5.0	0.0

INPUT HOUR	MET DATA MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
1	600.00	279.00	5
2	600.00	280.00	2
3	600.00	280.00	2

STATION NO.	HOUR	WIND DIRECTION (DEG)	WIND SPEED (M/S)
1	1	200.00	4.00
	2	210.00	4.00
	3	90.00	4.00
2	1	200.00	3.00
	2	200.00	4.00
	3	90.00	5.00
3	1	200.00	3.00
	2	90.00	4.00
	3	90.00	5.00
4	1	200.00	3.00
	2	90.00	3.00
	3	90.00	5.00
5	1	200.00	4.00
	2	210.00	5.00
	3	90.00	5.00
6	1	210.00	4.00
	2	200.00	4.00
	3	90.00	4.00
7	1	200.00	5.00
	2	210.00	4.00
	3	90.00	5.00
8	1	200.00	4.00
	2	90.00	5.00
	3	90.00	5.00
9	1	90.00	3.00
	2	90.00	4.00
	3	90.00	6.00
10	1	200.00	4.00
	2	90.00	5.00
	3	90.00	5.00
11	1	200.00	4.00
	2	210.00	5.00
	3	90.00	5.00
12	1	200.00	5.00
	2	200.00	4.00
	3	200.00	4.00
13	1	200.00	3.00
	2	200.00	4.00
	3	200.00	4.00
14	1	200.00	5.00
	2	200.00	4.00
	3	90.00	5.00
15	1	30.00	3.00
	2	90.00	4.00
	3	90.00	5.00
16	1	90.00	5.00
	2	90.00	5.00
	3	90.00	6.00
17	1	90.00	4.00
	2	90.00	5.00
	3	90.00	6.00
18	1	200.00	4.00
	2	200.00	3.00
	3	90.00	5.00
19	1	200.00	3.00
	2	200.00	4.00
	3	190.00	5.00
20	1	200.00	3.00
	2	200.00	4.00
	3	200.00	4.00
21	1	200.00	3.00
	2	200.00	4.00
	3	200.00	4.00
22	1	200.00	3.00
	2	200.00	4.00
	3	90.00	4.00
23	1	90.00	6.00
	2	90.00	6.00
	3	90.00	6.00
24	1	200.00	4.00
	2	90.00	3.00
	3	90.00	5.00
25	1	220.00	4.00
	2	200.00	4.00
	3	200.00	4.00

MEGOLFANT MET CONDITIONS...

AVERAGE TEMP.= 274.07 MODAL STABILITY= 2

STATION NO.	WIND DIRECTION	WIND SPEED	AVG. WIND SPEED	WIND PERSISTANCE
1	175.00	2.42	4.00	0.604
2	158.39	2.36	4.00	0.590
3	109.47	2.82	4.00	0.705
4	114.01	2.51	3.67	0.684
5	174.03	2.72	4.67	0.583
6	175.00	2.42	4.00	0.604
7	180.24	2.09	3.33	0.628
8	113.53	3.14	4.67	0.672
9	90.00	4.33	4.33	1.000
10	114.54	2.34	4.00	0.835
11	174.03	2.72	4.67	0.583
12	200.00	3.67	3.67	1.000
13	200.00	3.67	3.67	1.000
14	158.39	2.36	4.00	0.590
15	70.10	3.81	4.00	0.901
16	90.00	5.33	5.33	1.000
17	90.00	5.00	5.00	1.000
18	154.39	2.36	4.00	0.590
19	143.84	3.99	4.00	0.946
20	200.00	3.67	3.67	1.000
21	200.00	3.67	3.67	1.000
22	186.28	2.60	3.67	0.816
23	90.00	5.00	5.00	1.000
24	114.54	2.34	4.00	0.835
25	209.04	3.45	4.00	0.987

INPUT RECEPTORS

RECEPTOR #	IDENTIFICATION	EAST	NORTH
1 I	M1	17.00	13.00
2 I	M2	15.00	13.00
3 I	M3	13.00	15.00
4 I	M4	15.00	17.00

SIGNIFICANT POINT RECEPTORS

RECEPTOR #	EAST	NORTH	MAXIMUM MAX CONC.
5 P 1	8.73	7.71	0.000026+00
6 P 1	7.00	10.00	0.000026+00
7 P 1	6.71	15.00	0.000026+00
8 P 1	8.00	10.34	0.000026+00
9 P 3	9.09	5.30	0.000026+00
10 P 3	7.79	8.40	0.000026+00
11 P 3	8.05	10.34	0.000026+00
12 P 4	7.01	12.83	0.000026+00
13 P 5	5.00	9.43	0.000026+00
14 P 5	5.09	11.39	0.000026+00

SIGNIFICANT AREA SOURCE RECEPTORS

RECEPTOR #	EAST	NORTH
15 A 6	7.01	8.17
16 A 2	8.18	10.13
17 A 3	7.79	8.75
18 A 4	5.96	7.10
19 A 5	7.72	6.13
20 A 1	6.07	15.00
21 A 7	6.13	9.00

HONEYCOMB RECEPTORS

RECEPTOR #	EAST	NORTH
22	3.00	0.0
23	6.00	0.0
24	9.00	0.0
25	12.00	0.0
26	15.00	0.0
27	18.00	0.0
28	21.00	0.0
29	24.00	0.0
30	27.00	0.0
31	30.00	0.0
32	1.50	2.60
33	4.50	2.60
34	7.50	2.60
35	10.50	2.60
36	13.50	2.60
37	16.50	2.60
38	19.50	2.60
39	22.50	2.60
40	25.50	2.60
41	28.50	2.60
42	3.00	5.20
43	12.00	5.20
44	15.00	5.20
45	18.00	5.20
46	21.00	5.20
47	24.00	5.20
48	27.00	5.20
49	30.00	5.20
50	1.50	7.79
51	4.50	7.79
52	10.50	7.79
53	13.50	7.79
54	16.50	7.79
55	19.50	7.79
56	22.50	7.79
57	25.50	7.79
58	28.50	7.79
59	12.00	10.39
60	15.00	10.39
61	18.00	10.39
62	21.00	10.39
63	24.00	10.39
64	27.00	10.39
65	30.00	10.39
66	1.50	12.99
67	4.50	12.99
68	10.50	12.99
69	13.50	12.99
70	16.50	12.99
71	19.50	12.99
72	22.50	12.99
73	25.50	12.99
74	28.50	12.99
75	3.00	15.59
76	21.00	15.59
77	24.00	15.59
78	27.00	15.59
79	30.00	15.59
80	1.50	18.19
81	4.50	18.19
82	10.50	18.19
83	13.50	18.19
84	16.50	18.19
85	19.50	18.19
86	22.50	18.19
87	25.50	18.19
88	28.50	18.19
89	3.00	20.78
90	6.00	20.78
91	9.00	20.78
92	12.00	20.78
93	15.00	20.78
94	18.00	20.78
95	21.00	20.78
96	24.00	20.78
97	27.00	20.78
98	30.00	20.78
99	1.50	23.38
100	4.50	23.38
101	7.50	23.38
102	10.50	23.38
103	13.50	23.38
104	16.50	23.38
105	19.50	23.38
106	22.50	23.38
107	25.50	23.38
108	28.50	23.38
109	3.00	25.98
110	6.00	25.98
111	9.00	25.98
112	12.00	25.98
113	15.00	25.98
114	18.00	25.98
115	21.00	25.98
116	24.00	25.98
117	27.00	25.98
118	30.00	25.98
119	1.50	28.58
120	4.50	28.58
121	7.50	28.58
122	10.50	28.58
123	13.50	28.58
124	16.50	28.58
125	19.50	28.58
126	22.50	28.58
127	25.50	28.58
128	28.50	28.58

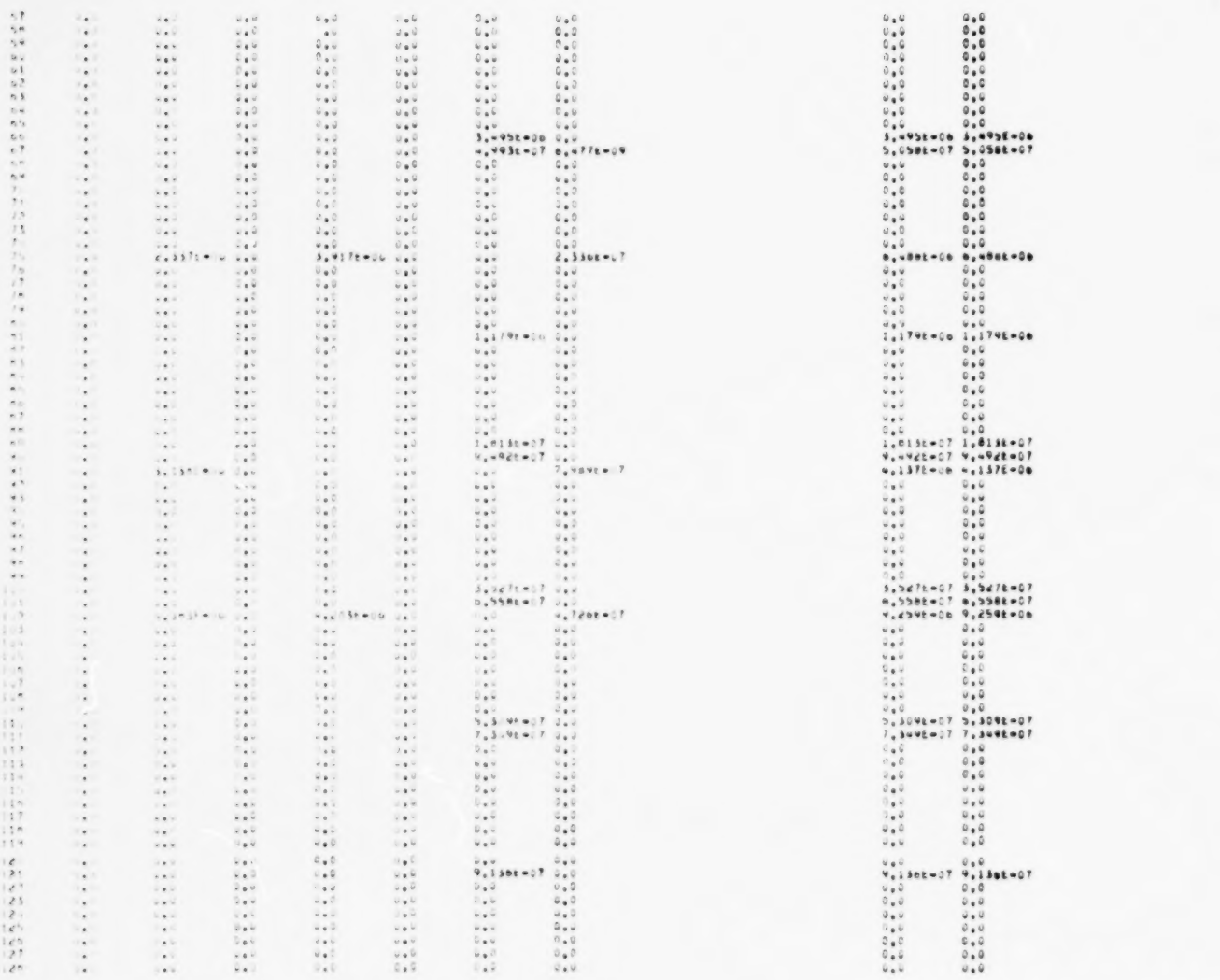
SO2 CONTRIBUTIONS(G/CU. M) FROM SIGNIFICANT POINT SOURCES : HOUR 1

RANK	1	2	3	4	5	TOTAL SIGNIF POINT	TOTAL ALL POINT SOURCES
SOURCE # / RECEP #	1	2	3	4	5		
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	1.080E-10	1.080E-10	1.080E-10
4	0.0	0.0	0.0	0.0	1.237E-12	1.237E-12	1.237E-12
5	2.22[illegible]E-04	0.0	1.945E-04	0.0	0.0	4.172E-04	4.172E-04
6	3.[illegible]E-23	0.0	1.210E-07	6.7[illegible]E-06	1.219E-13	6.822E-06	6.822E-06
7	2.593E-13	3.303E-11	1.626E-08	6.450E-07	1.767E-05	1.833E-05	1.833E-05
8	[illegible]E-06	3.273E-11	3.626E-08	3.474E-08	1.799E-05	1.950E-05	1.950E-05
9	1.129E-08	0.0	2.590E-21	0.0	0.0	1.129E-08	1.129E-08
10	4.467E-04	0.0	2.749E-12	0.0	0.0	4.467E-04	4.467E-04
11	3.550E-23	0.0	2.801E-06	4.221E-05	1.[illegible]78E-10	4.501E-05	4.501E-05
12	0.0	0.0	2.302E-27	2.947E-06	5.889E-08	3.236E-06	3.236E-06
13	0.0	0.0	0.0	0.0	4.904E-05	4.904E-05	4.904E-05
14	0.0	0.0	2.904E-22	0.0	6.223E-05	6.223E-05	6.223E-05
15	4.16[illegible]E-04	0.0	4.849E-10	0.0	0.0	4.160E-04	4.160E-04
16	7.207E-05	0.0	2.287E-19	3.073E-25	2.597E-10	7.207E-05	7.207E-05
17	1.223E-06	0.0	3.901E-07	1.361E-07	0.0	1.751E-06	1.751E-06
18	8.724E-06	0.0	1.150E-19	0.0	0.0	8.724E-06	8.724E-06
19	[illegible]E-06	0.0	4.321E-08	0.0	0.0	4.404E-06	4.404E-06
20	0.0	0.0	1.[illegible]E-22	0.0	1.199E-08	1.199E-08	1.199E-08
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	[illegible]E-23	0.0	[illegible]	0.0	0.0	6.078E-07	6.078E-07
43	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0
46	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	[illegible]	0.0	0.0	0.0	0.0	2.744E-09	2.744E-09
52	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66	0.0	0.0	0.0	0.0	1.998E-13	1.998E-13	1.998E-13
67	[illegible]	0.0	[illegible]E-17	2.16[illegible]E-25	4.580E-05	4.580E-05	4.580E-05
68	0.0	0.0	2.59[illegible]E-15	0.0	[illegible]E-13	4.121E-13	4.121E-13
69	0.0	0.0	0.0	0.0	5.1[illegible]E-16	5.104E-16	5.104E-16
70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	[illegible]E-05	[illegible]	[illegible]E-05	3.997E-07	1.409E-04	1.409E-04
76	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80	0.0	0.0	[illegible]E-22	1.115E-25	2.450E-11	2.450E-11	2.450E-11
81	[illegible]E-12	[illegible]	[illegible]E-12	7.710E-13	3.935E-06	3.935E-06	3.935E-06
82	0.0	5.21[illegible]E-05	0.0	[illegible]E-05	1.[illegible]E-06	5.489E-05	5.489E-05
83	0.0	3.377E-13	0.0	0.0	4.333E-08	4.333E-08	4.333E-08
84	0.0	0.0	0.0	0.0	1.262E-16	1.262E-16	1.262E-16
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89	0.0	0.0	9.1[illegible]1E-16	2.020E-15	3.390E-08	3.390E-08	3.390E-08
90	1.293E-11	2.224E-11	4.710E-08	3.285E-09	1.190E-05	1.196E-05	1.196E-05
91	6.1[illegible]E-05	1.241E-04	2.714E-05	1.[illegible]32E-05	8.472E-06	2.315E-04	2.315E-04
92	1.524E-25	6.44[illegible]E-05	0.0	6.970E-06	4.270E-07	7.186E-05	7.186E-05
93	0.0	2.[illegible]E-15	0.0	0.0	3.317E-09	3.317E-09	3.317E-09
94	0.0	0.0	0.0	0.0	2.000E-19	2.000E-19	2.000E-19
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99	0.0	0.0	7.[illegible]61E-15	1.232E-17	3.988E-11	3.989E-11	3.989E-11
100	0.0	3.[illegible]94E-16	3.608E-10	6.667E-12	5.934E-06	5.934E-06	5.934E-06

101	1.547E-06	1.126E-05	1.444E-06	1.078E-07	1.354E-05		2.790E-05	2.790E-05
102	2.420E-05	1.275E-04	2.763E-05	5.569E-05	6.603E-06		2.439E-04	2.439E-04
103	1.221E-19	4.051E-05	8.842E-25	1.282E-06	7.931E-07		4.258E-05	4.258E-05
104	0.0	4.449E-06	0.0	2.315E-25	1.956E-09		4.500E-06	4.500E-06
105	0.0	7.878E-07	0.0	0.0	5.988E-28		7.878E-07	7.878E-07
106	0.0	1.350E-07	0.0	0.0	0.0		1.350E-07	1.350E-07
107	0.0	0.0	0.0	0.0	0.0		0.0	0.0
108	0.0	0.0	0.0	0.0	0.0		0.0	0.0
109	0.0	5.960E-21	7.317E-12	1.499E-16	8.433E-09		8.441E-09	8.441E-09
110	7.094E-16	2.600E-11	5.054E-09	3.079E-10	4.484E-06		4.490E-06	4.490E-06
111	8.438E-05	1.250E-04	1.209E-06	3.661E-06	1.423E-05		2.305E-04	2.305E-04
112	1.341E-06	9.152E-05	1.798E-05	4.484E-05	4.097E-06		1.598E-04	1.598E-04
113	0.0	2.798E-05	1.065E-15	2.809E-08	9.118E-08		2.808E-05	2.808E-05
114	0.0	5.500E-06	0.0	0.0	5.200E-11		5.500E-06	5.500E-06
115	0.0	1.305E-06	0.0	0.0	2.958E-28		1.305E-06	1.305E-06
116	0.0	2.982E-07	0.0	0.0	0.0		2.982E-07	2.982E-07
117	0.0	0.0	0.0	0.0	0.0		0.0	0.0
118	0.0	0.0	0.0	0.0	0.0		0.0	0.0
119	4.934E-28	8.302E-21	2.093E-13	2.658E-20	5.840E-11		5.841E-11	5.841E-11
120	1.344E-10	1.760E-15	1.433E-10	6.140E-13	1.188E-07		1.189E-07	1.189E-07
121	2.332E-09	8.166E-05	2.560E-08	2.906E-06	4.594E-06		8.919E-05	8.919E-05
122	6.069E-06	1.778E-05	1.418E-05	1.859E-05	1.282E-05		7.003E-05	7.003E-05
123	5.778E-05	5.886E-05	5.869E-06	3.934E-05	7.963E-07		1.626E-04	1.626E-04
124	4.912E-05	2.344E-05	7.514E-15	2.004E-05	1.430E-06		8.982E-05	8.982E-05
125	0.0	5.717E-06	0.0	7.282E-06	3.730E-07		1.337E-05	1.337E-05
126	0.0	1.701E-06	0.0	2.733E-06	1.702E-07		4.610E-06	4.610E-06
127	0.0	4.710E-07	0.0	0.0	1.021E-07		5.737E-07	5.737E-07
128	0.0	0.0	0.0	0.0	4.316E-08		4.316E-08	4.316E-08

SUM OF CONTRIBUTIONS(G/CU.M) FROM SIGNIFICANT AREA SOURCES : HOUR 1

SOURCE # RECEP #	1	2	3	4	5	6	7	TOTAL SIGNIF AREA	TOTAL ALL AREA SOURCES
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	3.967E-06	0.0	5.635E-06	0.0	0.0	1.797E-07	9.760E-06	9.760E-06
7	0.0	0.0	0.0	0.0	0.0	0.0	8.038E-07	8.038E-07	8.038E-07
8	0.0	0.0	0.0	0.0	0.0	4.802E-07	0.0	4.802E-07	4.802E-07
9	0.0	0.0	0.0	1.709E-05	0.0	0.0	0.0	1.709E-05	1.709E-05
10	0.0	1.765E-05	0.0	9.053E-06	0.0	0.0	2.699E-07	2.755E-05	2.755E-05
11	3.140E-05	0.0	0.0	5.217E-06	0.0	0.0	0.0	3.662E-05	3.662E-05
12	0.0	8.726E-06	0.0	9.147E-06	0.0	0.0	5.804E-07	1.045E-05	1.045E-05
13	0.0	0.0	0.0	0.0	0.0	0.0	1.630E-07	1.630E-07	1.630E-07
14	0.0	0.0	0.0	0.0	0.0	1.457E-06	2.792E-08	1.485E-06	1.485E-06
15	0.0	8.964E-06	0.0	1.076E-05	0.0	0.0	8.735E-08	1.980E-05	1.980E-05
16	0.0	3.230E-05	0.0	0.0	0.0	0.0	8.210E-07	3.112E-05	3.112E-05
17	9.593E-05	0.0	0.0	5.524E-06	0.0	0.0	0.0	1.005E-04	1.005E-04
18	0.0	0.0	0.0	2.789E-05	0.0	0.0	5.588E-07	2.845E-05	2.845E-05
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	4.253E-06	4.253E-06	4.253E-06
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	3.729E-06	3.729E-06	3.729E-06
33	0.0	0.0	0.0	0.0	0.0	0.0	9.104E-07	9.104E-07	9.104E-07
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	0.0	0.0	0.0	0.0	1.972E-06	0.0	0.0	1.972E-06	1.972E-06
43	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	0.0	0.0	0.0	0.0	0.0	0.0	1.032E-06	1.032E-06	1.032E-06
52	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



SUMMARY SO2 CONCENTRATION TABLE 1 HOUR 1

HOUR	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
1	400.00	279.00	5

STATION NO.	WIND DIRECTION (DEG)	WIND SPEED (M/S)
1	200.00	4.00
2	200.00	3.00
3	200.00	3.00
4	200.00	3.00
5	200.00	4.00
6	210.00	4.00
7	200.00	3.00
8	200.00	4.00
9	90.00	3.00
10	200.00	4.00
11	200.00	4.00
12	200.00	3.00
13	200.00	3.00
14	200.00	3.00
15	50.00	3.00
16	90.00	5.00
17	90.00	4.00
18	200.00	4.00
19	200.00	3.00
20	200.00	3.00
21	200.00	3.00
22	200.00	3.00
23	90.00	8.00
24	200.00	4.00
25	200.00	4.00

RECEPTOR NO.			EAST	NORTH	TOTAL PHLM SIGNIF POINT SOURCES	TOTAL PHLM ALL POINT SOURCES	TOTAL PHLM SIGNIF AREA SOURCES	TOTAL PHLM ALL AREA SOURCES	TOTAL PHLM ALL SOURCES	CONCENTRATION RANK
1	A	0	17.00	19.00	0.0	0.0	0.0	0.0	0.0	87
2	A	0	17.00	13.00	0.0	0.0	0.0	0.0	0.0	88
3	A	0	13.00	15.00	1.0804E-10	1.0804E-10	0.0	0.0	1.0804E-10	50
4	A	0	19.00	17.00	1.2374E-12	1.2374E-12	0.0	0.0	1.2374E-12	82
5	A	1	0.75	1.14	4.1765E-04	4.1765E-04	0.0	0.0	4.1765E-04	3
6	A	1	7.00	11.00	8.8617E-06	8.8617E-06	9.7418E-06	9.7418E-06	1.8560E-05	27
7	A	2	0.76	17.00	1.8529E-05	1.8529E-05	8.0379E-07	8.0379E-07	1.9152E-05	20
8	A	2	0.00	17.74	1.9501E-05	1.9501E-05	4.8222E-07	4.8222E-07	1.9982E-05	25
9	A	3	0.49	0.50	1.1689E-06	1.1689E-06	1.7088E-05	1.7088E-05	1.7100E-05	28
10	A	3	0.00	0.00	4.4867E-04	4.4867E-04	2.7553E-05	2.7553E-05	4.7425E-04	1
11	A	4	0.00	10.34	4.5015E-05	4.5015E-05	3.6078E-05	3.6078E-05	8.1093E-05	13
12	A	4	7.61	10.03	3.2305E-06	3.2305E-06	1.0454E-05	1.0454E-05	1.3090E-05	29
13	A	5	3.66	9.43	4.9440E-05	4.9440E-05	1.6302E-07	1.6302E-07	4.9203E-05	19
14	A	5	3.09	11.35	6.2263E-05	6.2263E-05	1.4047E-06	1.4047E-06	6.3717E-05	17
15	A	6	7.31	0.19	4.1003E-04	4.1003E-04	1.9892E-05	1.9892E-05	4.3572E-04	6
16	A	6	6.63	10.13	7.2000E-05	7.2000E-05	3.1119E-05	3.1119E-05	1.0311E-04	10
17	A	5	7.74	0.75	1.7508E-06	1.7508E-06	1.0055E-04	1.0055E-04	1.0230E-04	11
18	A	7	5.90	7.10	8.7641E-06	8.7641E-06	2.8447E-05	2.8447E-05	3.7171E-05	22
19	A	5	7.70	8.13	4.4039E-06	4.4039E-06	0.0	0.0	4.4039E-06	30
20	A	1	6.44	15.00	1.1988E-08	1.1988E-08	0.0	0.0	1.1988E-08	54
21	A	7	6.13	7.60	0.0	0.0	4.2529E-06	4.2529E-06	4.2529E-06	39
22	A	7	3.07	7.60	0.0	0.0	0.0	0.0	0.0	89
23	A	8	8.00	7.60	0.0	0.0	0.0	0.0	0.0	70
24	A	8	4.00	7.60	0.0	0.0	0.0	0.0	0.0	71
25	A	8	16.00	7.60	0.0	0.0	0.0	0.0	0.0	72
26	A	8	15.00	7.60	0.0	0.0	0.0	0.0	0.0	73
27	A	8	10.00	7.60	0.0	0.0	0.0	0.0	0.0	74
28	A	8	21.00	7.60	0.0	0.0	0.0	0.0	0.0	75
29	A	8	29.00	7.60	0.0	0.0	0.0	0.0	0.0	76
30	A	8	27.00	7.60	0.0	0.0	0.0	0.0	0.0	77
31	A	8	30.00	7.60	0.0	0.0	0.0	0.0	0.0	78
32	A	8	1.50	7.60	0.0	0.0	3.7291E-08	3.7291E-08	3.7291E-08	40
33	A	8	4.50	7.60	0.0	0.0	9.1039E-07	9.1039E-07	9.1039E-07	45
34	A	8	7.50	7.60	0.0	0.0	0.0	0.0	0.0	79
35	A	8	10.50	7.60	0.0	0.0	0.0	0.0	0.0	80
36	A	8	13.50	7.60	0.0	0.0	0.0	0.0	0.0	81
37	A	8	16.50	7.60	0.0	0.0	0.0	0.0	0.0	82
38	A	8	19.50	7.60	0.0	0.0	0.0	0.0	0.0	83
39	A	8	22.50	7.60	0.0	0.0	0.0	0.0	0.0	84
40	A	8	25.50	7.60	0.0	0.0	0.0	0.0	0.0	85
41	A	8	28.50	7.60	0.0	0.0	0.0	0.0	0.0	86
42	A	9	9.00	7.60	6.6070E-07	6.6070E-07	1.9725E-06	1.9725E-06	2.5801E-06	42
43	A	9	12.00	7.60	0.0	0.0	0.0	0.0	0.0	87
44	A	9	15.00	7.60	0.0	0.0	0.0	0.0	0.0	88
45	A	9	18.00	7.60	0.0	0.0	0.0	0.0	0.0	89
46	A	9	21.00	7.60	0.0	0.0	0.0	0.0	0.0	90
47	A	9	24.00	7.60	0.0	0.0	0.0	0.0	0.0	91
48	A	9	27.00	7.60	0.0	0.0	0.0	0.0	0.0	92
49	A	9	30.00	7.60	0.0	0.0	0.0	0.0	0.0	93
50	A	9	1.50	7.79	0.0	0.0	0.0	0.0	0.0	94
51	A	9	4.50	7.79	0.0	0.0	1.0323E-06	1.0323E-06	1.0323E-06	44
52	A	9	10.50	7.79	2.7438E-09	2.7438E-09	0.0	0.0	2.7438E-09	57
53	A	9	13.50	7.79	0.0	0.0	0.0	0.0	0.0	95
54	A	9	16.50	7.79	0.0	0.0	0.0	0.0	0.0	96
55	A	9	19.50	7.79	0.0	0.0	0.0	0.0	0.0	97
56	A	9	22.50	7.79	0.0	0.0	0.0	0.0	0.0	98
57	A	9	25.50	7.79	0.0	0.0	0.0	0.0	0.0	99
58	A	9	28.50	7.79	0.0	0.0	0.0	0.0	0.0	100

```
C     MAIN
C
      COMMON /C2/ UE(6),TD,TN,TMN,MMIN,DINT,YCON,TA(4),IPG,XG,YG,IRD
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),GB(2),NG,IVER,IWR
      COMMON /C5/ Q(100,4),GA(2),IAD(4,5),XGG,YGG,IAB,TDA,TDB,TDC,IPL
     1KEYFOR KEYW(4)/'RWWA','BTAT','WEIG','CDM'/,W/4/,
     X   KEY(3),UNITS(3),TITLE(13)
      LOGICAL SECOND/.FALSE./
   10 READ(5,5010,END=900) KEY,UNITS,TITLE
 5010 FORMAT(3A4,T15,3I2,12A4,A2)
      DO 20 I=1,W
      IF(KEY(1).EQ.KEYW(I)) GO TO 30
   20 CONTINUE
      WRITE(6,6020) KEY(1)
 6020 FORMAT('0',T11,'INVALID KEYWORD ',A4/T11,'EXECUTION TERMINATED.')
      STOP 1
   30 WRITE(6,6030) KEY,TITLE
 6030 FORMAT('1',T11,3A4/T21,12A4,A2//)
      IF(SECOND) GO TO 40
      IRD=UNITS(1)
      IF(IRD.EQ.0) IRD=5
      IWR=UNITS(2)
      IF(IWR.EQ.0) IWR=6
      IPL=UNITS(3)
      IF(IPL.EQ.0) IPL=7
      SECOND=.TRUE.
   40 GO TO (100,200,300,400),I
  100 CALL INPAN
      GO TO 10
  200 CALL INSTA
      GO TO 10
  300 CALL WEIGHT
      GO TO 10
  400 CALL GRM
  900 WRITE(6,6900)
 6900 FORMAT('0END OF PROGRAM.')
      STOP
      END
```

```
      SUBROUTINE INPAN
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,ALPHA,LTHETA,RADIUS,POWER
      LOGICAL NOFACT,LTHETA
      COMMON /FACTOR/ FACT(10,10,10),NOFACT
      LOGICAL PRINT
      COMMON /CNTRL/ PRINT
      COMMON /C2/ UE(6),TD,TN,TMN,MMIN,DINT,YCON,TA(4),IPG,XG,YG,IRD
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),GB(2),NG,IVER,IWR
      COMMON /C5/ Q(100,4),GA(2),IAD(4,5),XGG,YGG,IAB,TDA,TDB,TDC,IPL
     1,KEY(3),UNITS(3),TITLE(13)
     X   LTHETA,RADIUS,POWER
      REAL THETA/5.0/
      RADIUS=1.0
      LTHETA=.TRUE.
      POWER=2.
      READ(IRD,5000) ORIGIN,NX,NY,GX,GY,      PRINT,NOFACT,POWER
 5000 FORMAT(7F10.0/10I1/2I5,F10.0,L1,L2)
     X                 'WEIGHTING GRID NXB',I2,T51,'WEIGHTING GRID NYB',
     X   I2/T21,'WEIGHTING GRID GXB',F5.2,T51,'WEIGHTING GRID GYB',
     X   F5.2/T21,
     X   'PRINT INPUT AND MODES (',L1,')',T51,
     X   'NO. WEIGHTING FACTORS (',L1,')'
     X   /T21,'POWER',F4.1)
      IF(.NOT.LTHETA) WRITE(IWR,6010) THETA
      IF(.NOT..THETA) WRITE(IWR,6012) RADIUS
 6011 FORMAT(T21,'SEARCH ANGLE',F5.1)
 6012 FORMAT(T21,'SEARCH RADIUS',F7.2)
      IF(NX..E.0.OR.NX.GT.10.OR.NY.LE.0.OR.NY.GT.10) GO TO 500
      ALPHA=THETA*0.0087266
      RETURN
  500 WRITE(IWR,6500)
 6500 FORMAT('-',T21,'GRID DIMENSIONS ARE OUT OF RANGE.'/T21,
     X   'EXECUTION TERMINATED.')
      STOP 1
      END
```

```
      BLOCK DATA
      LOGICAL NOFACT,LTHETA
      COMMON /FACTOR/ FACT(10,10,10),NOFACT
      DATA FACT/1000*1./,NOFACT/.TRUE./
      LOGICAL PRINT
      COMMON /CNTRL/ PRINT
      DATA PRINT/.TRUE./
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,THETA,LTHETA,RADIUS,POWER
      DATA ORIGIN/0.,0./,NX,GY/2*1.0/,NX,NY/2*1/
      END
```

SUB CONTRIBUTION(G/CU. M) FROM SIGNIFICANT POINT SOURCES 1 HOUR 2

MEAN	1	2	3	4	5	TOTAL SIGNIF POINT	TOTAL ALL POINT SOURCES
SOURCE #	1	2	3	4	5		
WEIGHT #							
1	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0
2	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0
3	[illegible]	0.0	0.0	0.0	9.408E-17	9.408E-17	9.408E-17
4	[illegible]	0.0	0.0	0.0	0.0	0.0	0.0
5	3.819E-04	0.0	0.0	0.0	0.0	3.819E-04	3.819E-04
6	1.435E-04	0.0	1.435E-04	4.214E-08	8.979E-12	1.435E-04	1.435E-04
7	1.235E-05	7.247E-09	1.153E-04	1.571E-05	1.308E-05	1.565E-04	1.565E-04
8	6.349E-06	2.743E-09	1.569E-06	2.509E-06	1.308E-05	2.411E-05	2.411E-05
9	6.453E-08	0.0	4.029E-09	0.0	0.0	6.440E-06	6.440E-06
10	1.501E-14	0.0	5.215E-05	0.0	0.0	2.023E-04	2.023E-04
11	6.647E-13	0.0	0.0	0.0	7.353E-14	7.402E-13	7.402E-13
12	3.760E-14	0.0	6.456E-05	5.751E-05	1.423E-07	1.220E-04	1.220E-04
13	1.109E-14	0.0	0.0	0.0	8.322E-05	2.401E-04	2.401E-04
14	4.481E-15	0.0	5.543E-17	0.0	5.399E-05	1.481E-04	1.481E-04
15	5.801E-04	0.0	1.902E-04	0.0	0.0	5.703E-04	5.703E-04
16	5.953E-08	0.0	1.147E-11	3.245E-15	1.910E-09	5.954E-06	5.954E-06
17	6.534E-15	0.0	0.0	1.540E-07	0.0	1.390E-05	1.390E-05
18	3.473E-04	0.0	4.905E-09	0.0	0.0	3.473E-04	3.473E-04
19	1.195E-15	0.0	6.289E-04	0.0	0.0	6.198E-04	6.198E-04
20	[illegible]	[illegible]	5.533E-10	0.0	5.347E-07	5.347E-07	5.347E-07
21	[illegible]	[illegible]	[illegible]	0.0	[illegible]	0.0	0.0
22	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
23	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
24	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
25	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
26	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
27	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
28	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
29	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
30	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
31	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
32	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
33	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
34	[illegible]	[illegible]	[illegible]	0.0	0.0	3.028E-15	3.028E-15
35	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
36	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
37	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
38	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
39	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
40	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
41	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
42	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
43	[illegible]	[illegible]	[illegible]	0.0	0.0	1.092E-08	1.092E-08
44	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
45	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
46	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
47	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
48	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
49	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
50	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
51	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
52	[illegible]	[illegible]	[illegible]	0.0	0.0	3.089E-04	3.089E-04
53	[illegible]	[illegible]	[illegible]	0.0	0.0	4.986E-06	4.986E-06
54	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
55	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
56	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
57	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
58	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
59	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
60	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
61	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
62	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
63	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
64	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
65	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
66	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
67	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
68	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
69	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
70	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
71	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
72	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
73	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
74	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
75	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
76	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
77	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
78	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
79	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
80	[illegible]	[illegible]	[illegible]	7.588E-05	0.0	7.288E-09	7.288E-09
81	[illegible]	[illegible]	[illegible]	1.495E-13	4.861E-24	1.041E-04	1.041E-04
82	[illegible]	[illegible]	[illegible]	[illegible]	0.0	5.228E-12	5.228E-12
83	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
84	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
85	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
86	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
87	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
88	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
89	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
90	[illegible]	[illegible]	[illegible]	0.0	0.0	1.535E-04	1.535E-04
91	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
92	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
93	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
94	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
95	[illegible]	[illegible]	4.500E-17	4.006E-16	2.657E-08	2.657E-08	2.657E-08
96	1.277E-04	4.344E-17	5.417E-15	1.554E-16	8.239E-06	8.241E-06	8.241E-06
97	2.437E-13	5.190E-15	0.0	4.835E-06	1.703E-07	5.072E-05	5.072E-05
98	[illegible]	1.597E-16	0.0	0.0	8.178E-11	8.178E-11	8.178E-11
99	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
100	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
101	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
102	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
103	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
104	[illegible]	1.431E-22	2.439E-16	1.809E-16	6.259E-07	6.261E-07	6.261E-07
105	1.877E-04	1.919E-19	2.192E-08	5.940E-08	1.356E-05	1.902E-05	1.902E-05
106	1.180E-04	6.717E-15	5.524E-05	4.484E-05	7.309E-06	3.034E-04	3.034E-04
107	3.441E-11	9.419E-16	0.0	2.114E-08	7.708E-07	1.231E-05	1.231E-05
108	[illegible]	1.411E-17	0.0	6.080E-24	6.837E-10	6.837E-10	6.837E-10
109	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
110	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
111	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
112	[illegible]	[illegible]	0.0	0.0	0.0	0.0	0.0
113	[illegible]	5.955E-24	8.730E-16	2.111E-11	2.910E-08	3.007E-08	3.007E-08
114	2.194E-21	2.495E-16	1.021E-08	5.103E-09	7.147E-06	7.166E-06	7.166E-06

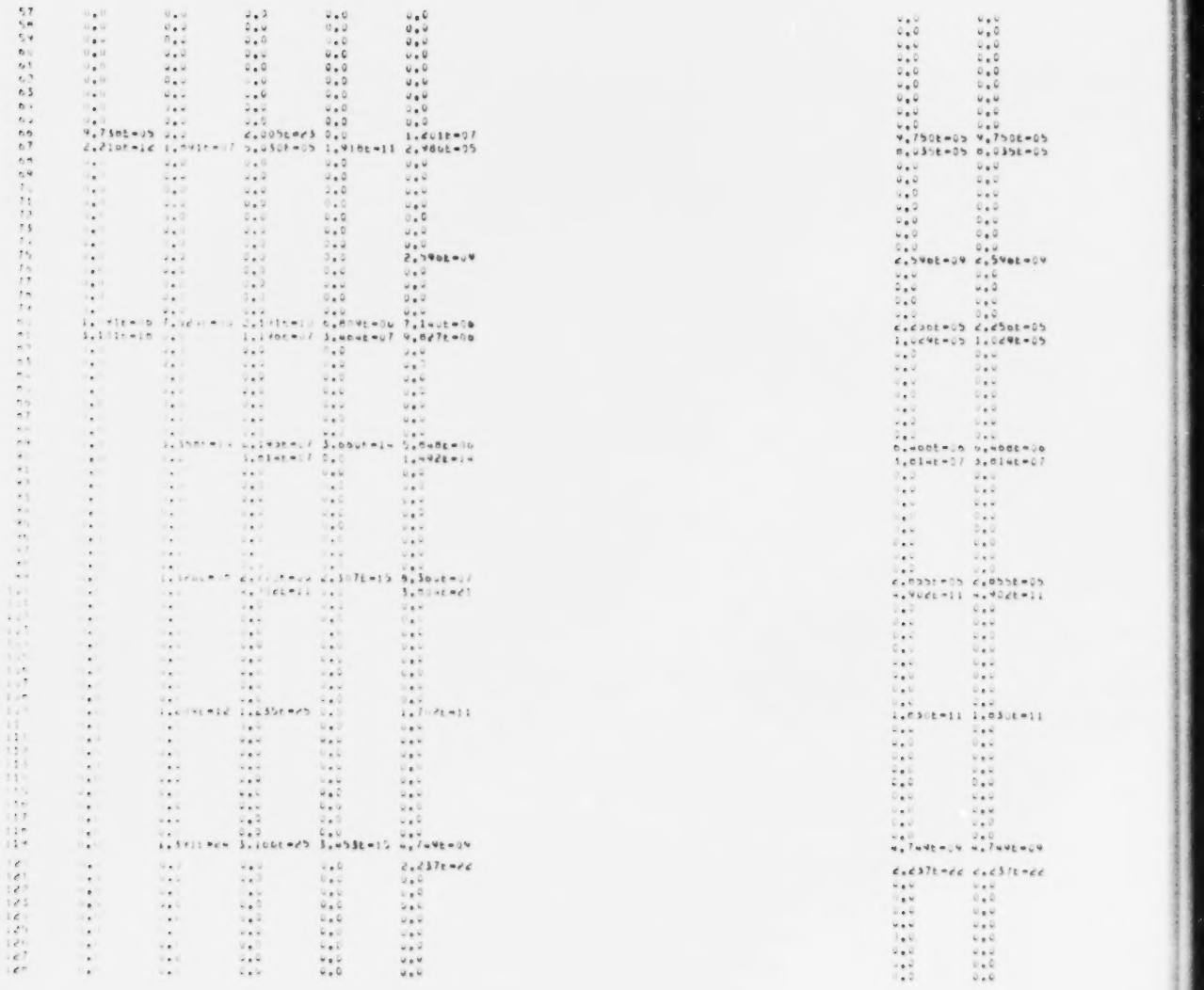
101	0,0111E+00	1,2477E+05	2,0155E+05	0,1338E+07	1,1346E+05	5,9298E+05
102	4,0830E+05	7,6008E+05	1,4938E+05	7,6711E+05	0,5028E+00	2,2760E+04
103	2,0222E+11	1,0471E+10	9,0897E+17	5,5308E+37	8,4938E+07	4,3760E+00
104	0,0	1,3178E+11	0,0	2,3788E+20	2,8788E+10	3,0096E+10
105	0,0	1,1137E+23	0,0	0,0	0,1350E+25	1,0988E+23
106	0,0	0,0	0,0	0,0	0,0	0,0
107	0,0	0,0	0,0	0,0	0,0	0,0
108	0,0	0,0	0,0	0,0	0,0	0,0
109	4,3644E+21	4,3600E+15	6,4224E+08	2,4242E+12	2,8278E+07	3,0508E+07
110	1,4718E+10	1,0518E+08	8,8726E+08	6,2478E+08	9,4188E+08	9,5398E+08
111	1,1098E+14	7,5194E+05	1,0942E+05	2,3988E+05	1,1038E+05	2,3608E+04
112	5,0944E+08	5,9918E+03	1,9148E+05	7,2738E+05	4,1848E+06	1,1058E+04
113	0,0	1,1208E+17	1,2258E+13	1,5408E+08	3,5038E+07	4,7008E+07
114	0,0	6,3698E+12	0,0	1,3338E+21	1,1588E+16	3,9458E+12
115	1,7148E+22	6,3748E+22	0,0	0,0	0,0	4,0888E+22
116	0,0	0,0	0,0	0,0	0,0	0,0
117	0,0	0,0	0,0	0,0	0,0	0,0
118	0,0	0,0	0,0	0,0	0,0	0,0
119	2,3178E+09	8,7658E+17	6,2217E+09	5,4448E+14	2,5708E+08	3,1988E+08
120	6,9058E+11	1,6648E+12	6,3768E+08	7,5038E+16	9,9518E+07	1,0408E+08
121	1,9508E+08	4,1188E+05	1,9468E+07	7,9638E+06	6,2918E+06	5,7898E+05
122	1,1398E+14	4,3308E+05	6,8768E+05	7,1758E+05	8,7048E+06	6,5398E+04
123	4,3368E+05	3,8198E+06	4,8318E+06	2,4508E+05	1,3038E+08	7,7338E+05
124	4,9018E+17	1,1918E+18	6,0078E+13	3,4558E+07	4,7698E+08	9,0078E+07
125	1,5918E+11	3,1358E+13	0,0	8,5038E+11	1,1908E+16	1,9708E+16
126	1,6408E+20	4,8748E+22	0,0	4,1498E+18	1,1808E+15	1,1918E+15
127	0,0	0,0	0,0	0,0	2,4598E+20	4,0598E+20
128	0,0	0,0	0,0	0,0	0,0	0,0

RECEPTOR NO.	EAST	NORTH	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL POINT SOURCES	TOTAL FROM SIGNIF AREA SOURCES	TOTAL FROM ALL AREA SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1 J 0	17.00	15.00	0.0	0.0	0.0	0.0	0.0	81
2 J 0	15.00	13.00	0.0	0.0	0.0	0.0	0.0	82
3 J 0	13.00	15.00	9.4079E-17	9.4079E-17	0.0	0.0	9.4079E-17	51
4 J 0	15.00	17.00	0.0	0.0	0.0	0.0	0.0	83
5 K 1	8.73	7.74	3.6189E-04	3.6189E-04	0.0	0.0	3.6189E-04	3
6 K 1	7.00	10.62	1.4352E-04	1.4352E-04	5.0092E-06	5.0092E-06	1.4911E-04	10
7 K 2	8.70	13.00	1.5047E-04	1.5047E-04	9.3495E-07	9.3495E-07	1.5740E-04	13
8 K 2	8.60	14.94	2.4108E-05	2.4108E-05	1.0178E-06	1.0178E-06	2.5126E-05	25
9 K 3	8.44	9.36	6.4403E-06	6.4403E-06	1.4707E-05	1.4707E-05	2.1207E-05	26
10 K 3	8.79	8.48	2.0220E-04	2.0220E-04	2.0451E-05	2.0451E-05	2.2271E-04	11
11 K 4	8.05	10.34	7.4019E-13	7.4019E-13	1.2711E-05	1.2711E-05	1.2711E-05	28
12 K 4	7.01	12.05	1.2190E-04	1.2190E-04	7.2111E-06	7.2111E-06	1.2919E-04	17
13 K 5	9.22	9.45	2.4012E-04	2.4012E-04	9.0070E-07	9.0070E-07	2.4102E-04	7
14 K 5	8.84	11.35	1.4806E-04	1.4806E-04	1.9974E-06	1.9974E-06	1.5005E-04	15
15 A 6	7.41	8.19	5.7029E-04	5.7029E-04	1.4339E-05	1.4339E-05	5.8463E-04	1
16 A 6	8.43	13.13	5.9545E-06	5.9545E-06	2.3838E-05	2.3838E-05	2.9792E-05	24
17 A 5	7.79	9.75	1.3902E-05	1.3902E-05	1.7747E-05	1.7747E-05	3.1709E-05	23
18 A 4	5.96	7.16	3.4726E-04	3.4726E-04	6.1043E-05	6.1043E-05	3.9831E-04	2
19 A 5	7.74	6.13	2.1981E-04	2.1981E-04	1.4523E-05	1.4523E-05	2.3433E-04	9
20 A 1	6.40	15.00	5.3471E-07	5.3471E-07	0.0	0.0	5.3471E-07	42
21 A 7	6.13	4.20	0.0	0.0	3.3833E-06	3.3833E-06	3.3833E-06	35
22 K 0	5.00	8.0	0.0	0.0	0.0	0.0	0.0	84
23 K 0	0.00	8.0	0.0	0.0	0.0	0.0	0.0	85
24 K 0	4.00	8.0	0.0	0.0	0.0	0.0	0.0	86
25 K 0	12.00	8.0	0.0	0.0	0.0	0.0	0.0	87
26 K 0	13.00	8.0	0.0	0.0	0.0	0.0	0.0	88
27 K 0	14.00	8.0	0.0	0.0	0.0	0.0	0.0	89
28 K 0	21.00	8.0	0.0	0.0	0.0	0.0	0.0	70
29 K 0	24.00	8.0	0.0	0.0	0.0	0.0	0.0	71
30 K 0	27.00	8.0	0.0	0.0	0.0	0.0	0.0	72
31 K 0	30.00	8.0	0.0	0.0	0.0	0.0	0.0	73
32 K 0	1.50	4.00	0.0	0.0	3.0571E-06	3.0571E-06	3.0571E-06	36
33 K 0	4.50	4.00	3.6276E-15	3.6276E-15	0.0	0.0	3.6276E-15	53
34 K 0	7.50	4.00	0.0	0.0	0.0	0.0	0.0	74
35 K 0	10.50	4.00	0.0	0.0	0.0	0.0	0.0	75
36 K 0	13.50	4.00	0.0	0.0	0.0	0.0	0.0	76
37 K 0	16.50	4.00	0.0	0.0	0.0	0.0	0.0	77
38 K 0	19.50	4.00	0.0	0.0	0.0	0.0	0.0	78
39 K 0	22.50	4.00	0.0	0.0	0.0	0.0	0.0	79
40 K 0	25.50	4.00	0.0	0.0	0.0	0.0	0.0	80
41 K 0	28.50	4.00	0.0	0.0	0.0	0.0	0.0	81
42 K 0	4.0	4.00	1.4915E-08	1.4915E-08	1.1202E-05	1.1202E-05	1.1213E-05	30
43 K 0	12.00	4.00	0.0	0.0	0.0	0.0	0.0	82
44 K 0	13.0	4.00	0.0	0.0	0.0	0.0	0.0	83
45 K 0	18.00	4.00	0.0	0.0	0.0	0.0	0.0	84
46 K 0	21.00	4.00	0.0	0.0	0.0	0.0	0.0	85
47 K 0	24.00	4.00	0.0	0.0	0.0	0.0	0.0	86
48 K 0	27.00	4.00	0.0	0.0	0.0	0.0	0.0	87
49 K 0	30.00	4.00	0.0	0.0	0.0	0.0	0.0	88
50 K 0	1.50	1.79	0.0	0.0	1.5733E-07	1.5733E-07	1.5733E-07	40
51 K 0	4.50	1.79	5.0092E-04	5.0092E-04	4.9249E-07	4.9249E-07	5.0941E-04	5
52 K 0	7.50	1.79	4.9854E-06	4.9854E-06	0.0	0.0	4.9854E-06	34
53 K 0	10.50	1.79	0.0	0.0	0.0	0.0	0.0	89
54 K 0	13.50	1.79	0.0	0.0	0.0	0.0	0.0	90
55 K 0	16.50	1.79	0.0	0.0	0.0	0.0	0.0	91
56 K 0	19.50	1.79	0.0	0.0	0.0	0.0	0.0	92
57 K 0	22.50	1.79	0.0	0.0	0.0	0.0	0.0	93
58 K 0	25.50	1.79	0.0	0.0	0.0	0.0	0.0	94
59 K 0	28.50	1.79	0.0	0.0	0.0	0.0	0.0	95
60 K 0	13.50	1.34	0.0	0.0	0.0	0.0	0.0	96
61 K 0	16.50	1.34	0.0	0.0	0.0	0.0	0.0	97
62 K 0	21.00	1.34	0.0	0.0	0.0	0.0	0.0	98
63 K 0	24.00	1.34	0.0	0.0	0.0	0.0	0.0	99
64 K 0	27.00	1.34	0.0	0.0	0.0	0.0	0.0	100
65 K 0	30.00	1.34	0.0	0.0	0.0	0.0	0.0	101
66 K 0	1.50	1.00	7.8558E-04	7.8558E-04	2.5710E-06	2.5710E-06	2.5769E-06	37
67 K 0	4.50	1.00	1.4509E-04	1.4509E-04	1.0520E-06	1.0520E-06	1.0514E-04	16
68 K 0	13.50	1.00	5.2284E-12	5.2284E-12	0.0	0.0	5.2284E-12	33
69 K 0	16.50	1.00	0.0	0.0	0.0	0.0	0.0	102
70 K 0	19.50	1.00	0.0	0.0	0.0	0.0	0.0	103
71 K 0	22.50	1.00	0.0	0.0	0.0	0.0	0.0	104
72 K 0	25.50	1.00	0.0	0.0	0.0	0.0	0.0	105
73 K 0	28.50	1.00	0.0	0.0	0.0	0.0	0.0	106
74 K 0	28.50	1.00	0.0	0.0	0.0	0.0	0.0	107
75 K 0	9.00	19.54	1.9345E-04	1.9345E-04	2.7899E-06	2.7899E-06	1.9624E-04	14
76 K 0	21.00	19.54	0.0	0.0	0.0	0.0	0.0	108
77 K 0	24.00	19.54	0.0	0.0	0.0	0.0	0.0	109
78 K 0	27.00	19.54	0.0	0.0	0.0	0.0	0.0	110
79 K 0	30.00	19.54	0.0	0.0	0.0	0.0	0.0	111
80 K 0	1.50	16.17	2.0568E-08	2.0568E-08	2.0736E-07	2.0736E-07	2.3393E-07	45
81 K 0	4.50	16.17	6.2405E-06	6.2405E-06	7.0501E-07	7.0501E-07	9.0061E-06	32
82 K 0	10.50	16.17	5.6718E-05	5.6718E-05	0.0	0.0	5.6718E-05	22
83 K 0	13.50	16.17	8.1761E-11	8.1761E-11	0.0	0.0	8.1761E-11	52
84 K 0	16.50	16.17	0.0	0.0	0.0	0.0	0.0	112
85 K 0	19.50	16.17	0.0	0.0	0.0	0.0	0.0	113
86 K 0	22.50	16.17	0.0	0.0	0.0	0.0	0.0	114
87 K 0	25.50	16.17	0.0	0.0	0.0	0.0	0.0	115
88 K 0	28.50	16.17	0.0	0.0	0.0	0.0	0.0	116
89 K 0	3.00	24.78	6.2005E-07	6.2005E-07	4.5240E-07	4.5240E-07	1.0705E-06	39
90 K 0	6.00	24.78	1.6018E-05	1.6018E-05	7.6558E-07	7.6558E-07	1.6783E-05	27
91 K 0	9.00	24.78	3.0340E-04	3.0340E-04	7.0503E-06	7.0503E-06	3.1045E-04	4
92 K 0	16.00	24.78	1.2309E-05	1.2309E-05	0.0	0.0	1.2309E-05	29
93 K 0	19.00	24.78	6.8374E-10	6.8374E-10	0.0	0.0	6.8374E-10	49
94 K 0	18.00	24.78	0.0	0.0	0.0	0.0	0.0	117
95 K 0	21.00	24.78	0.0	0.0	0.0	0.0	0.0	118
96 K 0	24.00	24.78	0.0	0.0	0.0	0.0	0.0	119
97 K 0	27.00	24.78	0.0	0.0	0.0	0.0	0.0	120
98 K 0	30.00	24.78	0.0	0.0	0.0	0.0	0.0	121
99 K 0	1.50	23.58	3.0074E-08	3.0074E-08	0.0	0.0	3.0074E-08	48
100 K 0	4.50	23.58	7.1002E-06	7.1002E-06	6.9519E-07	6.9519E-07	7.8614E-06	33
101 K 0	7.50	23.58	5.9295E-05	5.9295E-05	1.0449E-06	1.0449E-06	6.0340E-05	20
102 K 0	10.50	23.58	2.2757E-04	2.2757E-04	0.0	0.0	2.2757E-04	10
103 K 0	13.50	23.58	2.3760E-06	2.3760E-06	0.0	0.0	2.3760E-06	38

104	0	18.50	23.38	5.0000E-10	5.0000E-10	0.0	0.0	5.0000E-10	50
105	0	19.50	23.38	1.0980E-23	1.0980E-23	0.0	0.0	1.0980E-23	59
106	0	22.50	23.38	0.0	0.0	0.0	0.0	0.0	122
107	0	25.50	23.38	0.0	0.0	0.0	0.0	0.0	123
108	0	28.50	23.38	0.0	0.0	0.0	0.0	0.0	124
109	0	3.00	25.98	5.0000E-07	5.0000E-07	0.0	0.0	5.0000E-07	44
110	0	6.00	25.98	9.5334E-06	9.5334E-06	9.9838E-07	9.9838E-07	1.0238E-05	31
111	0	9.00	25.98	2.5601E-04	2.5601E-04	9.5334E-07	9.5334E-07	2.5696E-04	8
112	0	12.00	25.98	1.1054E-04	1.1054E-04	0.0	0.0	1.1054E-04	18
113	0	15.00	25.98	4.7857E-07	4.7857E-07	0.0	0.0	4.7857E-07	43
114	0	18.00	25.98	5.5448E-12	5.5448E-12	0.0	0.0	5.5448E-12	54
115	0	21.00	25.98	4.0881E-22	4.0881E-22	0.0	0.0	4.0881E-22	58
116	0	24.00	25.98	0.0	0.0	0.0	0.0	0.0	125
117	0	27.00	25.98	0.0	0.0	0.0	0.0	0.0	126
118	0	30.00	25.98	0.0	0.0	0.0	0.0	0.0	127
119	0	1.50	28.58	5.1977E-08	5.1977E-08	0.0	0.0	5.1977E-08	47
120	0	4.50	28.58	1.0149E-06	1.0149E-06	0.0	0.0	1.0149E-06	40
121	0	7.50	28.58	5.7892E-05	5.7892E-05	0.9835E-07	0.9835E-07	5.8890E-05	21
122	0	10.50	28.58	2.5588E-04	2.5588E-04	0.0	0.0	2.5588E-04	6
123	0	13.50	28.58	7.7328E-05	7.7328E-05	0.0	0.0	7.7328E-05	19
124	0	16.50	28.58	9.3087E-07	9.3087E-07	0.0	0.0	9.3087E-07	41
125	0	19.50	28.58	1.4759E-10	1.4759E-10	0.0	0.0	1.4759E-10	51
126	0	22.50	28.58	1.1908E-15	1.1908E-15	0.0	0.0	1.1908E-15	56
127	0	25.50	28.58	2.0590E-20	2.0590E-20	0.0	0.0	2.0590E-20	60
128	0	28.58	28.58	0.0	0.0	0.0	0.0	0.0	128

SUB CONTINUITY(60/60, 11 FROM SIGNIFICANT POINT SOURCES I =1,6 J

I	1	2	3	4	5	TOTAL SIGNIF POINT	TOTAL ALL POINT SOURCES
J= 1							
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	2.1950E-04	0.0	0.0	0.0	0.0	2.1950E-04	2.1950E-04
6	2.8340E-15	0.0	0.0	0.0	0.0	2.8340E-15	2.8340E-15
7	0.719E-06	0.0	0.0	0.0	0.0	0.719E-06	0.719E-06
8	1.155E-08	0.0	0.0	0.0	0.0	1.155E-08	1.155E-08
9	2.170E-07	0.0	0.0	0.0	0.0	2.170E-07	2.170E-07
10	8.2251E-05	0.0	0.0	0.0	0.0	8.2251E-05	8.2251E-05
11	1.140E-16	0.0	0.0	0.0	0.0	1.140E-16	1.140E-16
12	2.643E-08	0.0	0.0	0.0	0.0	2.643E-08	2.643E-08
13	1.95E-04	0.0	0.0	0.0	0.0	1.95E-04	1.95E-04
14	4.958E-05	0.0	0.0	0.0	0.0	4.958E-05	4.958E-05
15	1.71E-04	0.0	0.0	0.0	0.0	1.71E-04	1.71E-04
16	2.119E-05	0.0	0.0	0.0	0.0	2.119E-05	2.119E-05
17	2.092E-08	0.0	0.0	0.0	0.0	2.092E-08	2.092E-08
18	4.45E-04	0.0	0.0	0.0	0.0	4.45E-04	4.45E-04
19	1.052E-08	0.0	0.0	0.0	0.0	1.052E-08	1.052E-08
20	2.243E-04	0.0	0.0	0.0	0.0	2.243E-04	2.243E-04
21	3.908E-08	0.0	0.0	0.0	0.0	3.908E-08	3.908E-08
22	7.371E-19	0.0	0.0	0.0	0.0	7.371E-19	7.371E-19
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	1.043E-09	0.0	0.0	0.0	0.0	1.043E-09	1.043E-09
33	4.884E-05	0.0	0.0	0.0	0.0	4.884E-05	4.884E-05
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	1.811E-17	0.0	0.0	0.0	0.0	1.811E-17	1.811E-17
43	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0
46	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50	2.582E-04	0.0	0.0	0.0	0.0	2.582E-04	2.582E-04
51	4.448E-04	0.0	0.0	0.0	0.0	4.448E-04	4.448E-04
52	2.554E-07	0.0	0.0	0.0	0.0	2.554E-07	2.554E-07
53	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56	0.0	0.0	0.0	0.0	0.0	0.0	0.0



SUB CONTRIBUTIONS(SUBSCRIPT) FROM SIGNIFICANT AREA SOURCES & HOUR 5

CASE	1	2	3	4	5	6	7	TOTAL SIGNIF AREA	TOTAL ALL AREA SOURCES
SOURCE # RELEASE #	0	2	3	4	5	1	7		
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.	0.0	0.0	1.2[illegible]E-05	0.[illegible]E-06	0.0	0.0	1.875E-05	1.875E-05
11	0.	1.[illegible]E-05	1.[illegible]E-06	0.0	0.0	0.0	0.0	1.771E-05	1.771E-05
12	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
46	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
101	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
103	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
104	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
105	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
106	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
107	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

108	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
109	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
110	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
111	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
112	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
113	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
114	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
115	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
116	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
117	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
118	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
119	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
120	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
121	0.0	0.0	0.0	0.0	0.0	9.1e09E-07	5.4e67E-07			1.4e0+E-06	1.4e0+E-06
122	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
123	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
124	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
125	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
126	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
127	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
128	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0

SUMMARY DOSE CONCENTRATION TABLE FOR HOUR 3

HOUR	MIXING HEIGHT (M)	TEMP (K)	STABILITY CLASS
3	900.00	288.00	E

STATION NO.	WIND DIRECTION (DEG)	WIND SPEED (M/S)
1	90.00	4.30
2	90.00	5.30
3	90.00	5.30
4	90.00	5.30
5	90.00	5.30
6	90.00	4.30
7	90.00	3.30
8	90.00	5.30
9	90.00	5.30
10	90.00	5.30
11	90.00	5.30
12	90.00	4.30
13	90.00	3.30
14	90.00	5.30
15	90.00	5.30
16	90.00	6.30
17	90.00	6.30
18	90.00	5.30
19	90.00	5.30
20	90.00	4.30
21	90.00	4.30
22	90.00	4.30
23	90.00	5.30
24	90.00	6.30
25	90.00	7.30

RECEPTOR NO.	X	Y	TOTAL FROM SINGLE POINT SOURCES	TOTAL FROM ALL POINT SOURCES	TOTAL FROM SINGLE AREA SOURCES	TOTAL FROM ALL AREA SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	1	0	12.00	12.00	0.0	0.0	0.0	50
2	2	0	12.00	12.00	0.0	0.0	0.0	50
3	3	0	12.00	12.00	0.0	0.0	0.0	50
4	4	0	12.00	12.00	0.0	0.0	0.0	50
5	X	1	8.73	7.74	4.1e+0E-04	0.0	4.1e+0E-04	5
6	X	1	7.48	1.06	6.033E-15	0.0	6.033E-15	54
7	X	1	6.76	13.08	6.718E-16	0.0	6.718E-16	49
8	X	1	6.69	12.74	1.155E-08	0.0	1.155E-08	44
9	X	1	6.64	5.98	1.170E-07	1.67+7E-05	1.68+4E-05	10
10	X	1	6.74	7.48	8.22E+7E-05	1.771SE-05	9.99E2E-05	4
11	X	1	8.15	1.34	1.1+77E-16	0.0	1.1+77E-16	35
12	X	1	7.01	10.02	6.62+55E-08	0.0	6.62+55E-08	28
13	X	1	5.66	9.43	1.95B1E-04	1.95B1E-04	8.0088E-07	9.0080E-07	1.98+1E-04	8
14	X	1	3.99	11.35	+.9577E-05	+.9577E-05	6.18Z6E-06	6.18Z6E-06	5.1759E-05	11
15	X	1	2.01	7.19	1.71U+E-04	1.71U+E-04	8.7+02E-06	8.7+02E-06	1.8038E-04	7
16	X	1	0.43	13.13	6.119+E-05	6.119+E-05	6.8810E-05	6.8810E-05	+.800+E-05	12
17	X	1	7.79	8.75	6.89Z1E-06	3.6921E-06	1.80++E-05	1.80++E-05	6.133BE-05	10
18	X	1	5.96	7.16	+.+5Z2E-04	+.+5Z2E-04	6.2Z28E-05	6.2Z28E-05	+.87Z+E-04	3
19	X	1	3.76	+.13	1.+52+E-04	1.+52+E-04	1.797BE-05	1.797BE-05	1.9029E-05	17
20	X	1	2.48	15.70	6.2+60E-04	6.2+60E-04	0.0	0.0	6.6+60E-04	6
21	X	1	6.13	+.00	3.9877E-04	3.9877E-04	3.2150E-04	3.2150E-04	7.1827E-04	61
22	X	1	5.10	+.0	7.3711E-19	7.3711E-19	0.0	0.0	7.3711E-19	38
23	X	1	9.00	+.0	+.0	0.0	0.0	0.0	0.0	42
24	X	1	4.00	+.0	0.0	0.0	0.0	0.0	0.0	43
25	X	1	14.00	+.0	0.0	0.0	0.0	0.0	0.0	44
26	X	1	19.40	+.0	0.0	0.0	0.0	0.0	0.0	45
27	X	1	10.00	+.0	0.0	0.0	0.0	0.0	0.0	46
28	X	1	41.00	0.0	0.0	0.0	0.0	0.0	0.0	47
29	X	1	64.00	+.0	+.0	0.0	0.0	0.0	0.0	48
30	X	1	87.00	+.0	0.0	0.0	0.0	0.0	0.0	49
31	X	1	98.00	+.0	+.0	0.0	0.0	0.0	0.0	50
32	X	2	1.53	2.80	1.++3+E-09	1.+03+E-09	3.1e09E-06	3.1e09E-06	3.1e79E-06	24
33	X	2	4.30	2.80	+.883BE-05	+.883BE-05	0.0	0.0	+.883BE-05	13
34	X	2	7.50	2.80	0.0	0.0	0.0	0.0	0.0	51
35	X	2	10.50	2.80	0.0	0.0	0.0	0.0	0.0	52
36	X	2	13.50	2.80	0.0	0.0	0.0	0.0	0.0	53
37	X	2	16.50	2.80	0.0	0.0	0.0	0.0	0.0	54
38	X	2	19.50	2.80	0.0	0.0	0.0	0.0	0.0	55
39	X	2	22.50	2.80	0.0	0.0	0.0	0.0	0.0	56
40	X	2	25.50	2.80	0.0	0.0	0.0	0.0	0.0	57
41	X	2	28.50	2.80	0.0	0.0	0.0	0.0	0.0	58
42	X	2	9.50	5.80	1.61U8E-17	1.610BE-17	1.5993E-05	1.5993E-05	1.5993E-05	19
43	X	2	12.00	5.80	0.0	0.0	0.0	0.0	0.0	59

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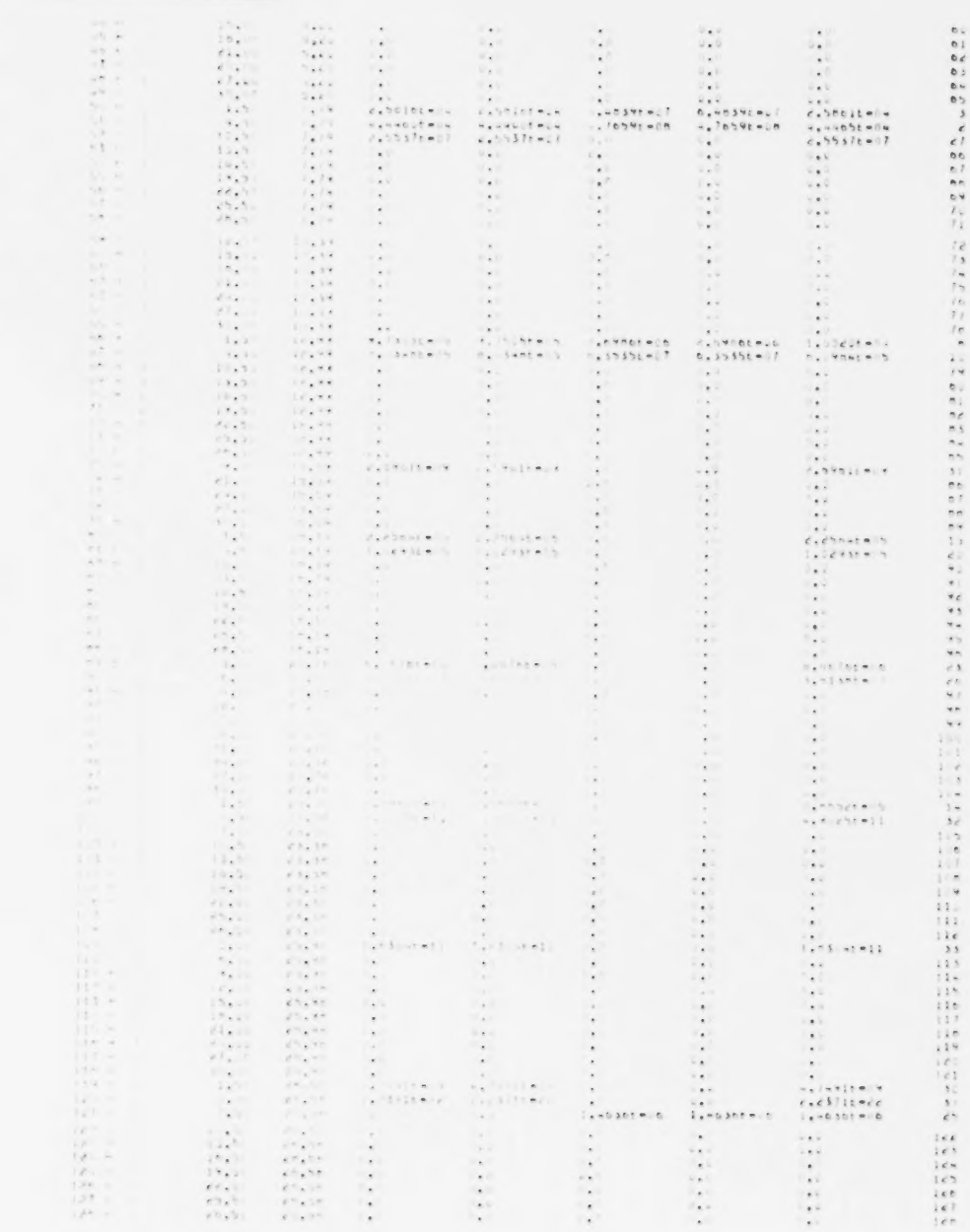

AVERAGE SUB CONTRIBUTION(G/CU. M) FROM SIGNIFICANT POINT SOURCES

SOURCE # / RECEP #	1	2	3	4	5	TOTAL SIGNIF POINT	TOTAL ALL POINT SOURCES
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	5.0d1E-11	5.0d1E-11	5.0d1E-11
4	0.0	0.0	0.0	0.0	4.1d5E-13	4.1d5E-13	4.1d5E-13
5	2.000E-04	0.0	6.470E-05	0.0	0.0	3.314E-04	3.314E-04
6	0.0 1.4E-13	0.0	4.787E-05	2.491E-06	3.034E-1d	5.078E-05	5.078E-05
7	4.117E-06	2.443E-09	3.845E-05	3.450E-06	1.249E-05	0.051E-05	0.051E-05
8	2.001E-06	9.319E-10	5.550E-07	8.479E-07	1.656E-05	1.454E-05	1.454E-05
9	2.221E-06	0.0	1.81UE-09	0.0	0.0	2.223E-06	2.223E-06
10	6.284E-04	0.0	1.738E-05	0.0	0.0	2.437E-04	2.437E-04
11	2.22d3E-13	0.0	9.330E-07	1.407E-05	2.454E-14	1.500E-05	1.500E-05
12	1.25UE-14	0.0	2.152E-05	2.015E-05	7.450E-08	4.175E-05	4.175E-05
13	4. 35E-15	0.0	3.121E-07	0.0	7.293E-05	1.018E-04	1.018E-04
14	3.137E-15	0.0	9.57UE-10	4.372E-13	5.5d3E-05	9.00dE-05	9.00dE-05
15	3.22UE-04	0.0	0.340E-05	0.0	0.0	3.000E-04	3.000E-04
16	2.001E-04	0.0	3.450E-1d	7.080E-06	8.497E-1d	3.307E-05	3.307E-05
17	3.91UE-08	0.0	1.50UE-07	9.072E-08	0.0	0.135E-06	0.135E-06
18	2.05UE-14	0.0	1.083E-09	2.200E-05	0.0	2.071E-04	2.071E-04
19	4.27E-08	0.0	7.10UE-05	0.0	0.0	7.509E-05	7.509E-05
20	4.91UE-15	2.44UE-15	5.93IE-10	0.038E-26	1.467E-06	7.494E-05	7.494E-05
21	4.99UE-08	0.0	1.07UE-06	0.0	0.0	1.5d3E-06	1.5d3E-06
22	0.111E-26	0.0	2.44VE-19	0.0	0.0	2.457E-19	2.457E-19
23	0.	0.0	0.0	0.0	0.0	0.0	0.0
24	0.	0.0	0.0	0.0	0.0	0.0	0.0
25	0.	0.0	0.0	0.0	0.0	0.0	0.0
26	0.	0.0	0.0	0.0	0.0	0.0	0.0
27	0.	0.0	0.0	0.0	0.0	0.0	0.0
28	0.	0.0	0.0	0.0	0.0	0.0	0.0
29	0.	0.0	0.0	0.0	0.0	0.0	0.0
30	0.	0.0	0.0	0.0	0.0	0.0	0.0
31	0.	0.0	0.0	0.0	0.0	0.0	0.0
32	0.	0.0	0.0	0.0	0.0	0.0	0.0
33	1.07VE-11	0.0	3.29UE-10	0.0	0.0	3.478E-10	3.478E-10
34	2.23dE-13	0.0	1.561E-05	0.0	0.0	1.561E-05	1.561E-05
35	0.	0.0	0.0	0.0	0.0	0.0	0.0
36	0.	0.0	0.0	0.0	0.0	0.0	0.0
37	0.	0.0	0.0	0.0	0.0	0.0	0.0
38	0.	0.0	0.0	0.0	0.0	0.0	0.0
39	0.	0.0	0.0	0.0	0.0	0.0	0.0
40	0.	0.0	0.0	0.0	0.0	0.0	0.0
41	0.	0.	0.	0.0	0.0	0.0	0.0
42	1.37VE-13	0.	2. 4dE-07	0.0	0.0	2.4d6E-07	2.4d6E-07
43	0.	0.0	0.	0.0	0.0	0.0	0.0
44	0.	0.0	0.0	0.0	0.0	0.0	0.0
45	0.	0.0	0.0	0.0	0.0	0.0	0.0
46	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47	0.	0.0	0.0	0.0	0.0	0.0	0.0
48	0.	0.0	0.0	0.0	0.0	0.0	0.0
49	0.	0.0	0.0	0.0	0.0	0.0	0.0
50	0.005E-05	0.0	0.	0.0	0.0	0.005E-05	0.005E-05
51	2.511E-04	0.	2.0d5E-0	0.0	0.0	2.512E-04	2.512E-04
52	1.741E-08	0.	0.0	0.0	0.0	1.741E-08	1.741E-08
53	0.	0.0	0.0	0.0	0.0	0.0	0.0
54	0.	0.0	0.0	0.0	0.0	0.0	0.0
55	0.	0.0	0.0	0.0	0.0	0.0	0.0
56	0.	0.0	0.0	0.0	0.0	0.0	0.0
57	0.	0.0	0.0	0.0	0.0	0.0	0.0
58	0.	0.0	0.0	0.0	0.0	0.0	0.0
59	0.	0.0	0.0	0.0	0.0	0.0	0.0
60	0.	0.0	0.0	0.0	0.0	0.0	0.0
61	0.	0.0	0.0	0.0	0.0	0.0	0.0
62	0.	0.0	0.0	0.0	0.0	0.0	0.0
63	0.	0.0	0.0	0.0	0.0	0.0	0.0
64	0.	0.0	0.0	0.0	0.0	0.0	0.0
65	1.2d8E-13	0.0	1.941E-07	0.0	0.0	4.245E-08	4.245E-08
66	1.997E-15	0.1d3E-1d	1.077E-05	0.394E-12	3.401E-05	4.478E-05	4.478E-05
67	0.0	0.0	0.054E-1d	0.0	1.879E-1d	1.879E-1d	1.879E-1d
68	0.0	0.0	0.0	0.0	1.701E-1d	1.701E-1d	1.701E-1d
69	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76	3.40E-07	5.951E-05	3.079E-06	3.930E-05	3.52UE-07	4.012E-05	4.012E-05
77	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81	3.050E-07	2.3d0E-06	7.502E-11	2.27UE-06	2.389E-06	7.530E-06	7.530E-06
82	4.253E-10	1.51UE-17	5.997E-08	1.155E-07	7.333E-08	7.09dE-06	7.09dE-06
83	4.791E-14	2.40dE-05	0.0	0.706E-06	4.794E-07	3.7d0E-05	3.7d0E-05
84	0.0	1.193E-15	0.0	0.0	1.447E-08	1.447E-08	1.447E-08
85	0.0	0.0	0.0	0.0	4.208E-17	4.208E-17	4.208E-17
86	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89	0.0	1.119E-14	2.065E-07	0.052E-11	2.1d9E-08	2.37dE-08	2.37dE-08
90	1.294E-09	0.130E-10	9.900E-07	2.050L-08	8.489E-08	9.451E-08	9.451E-08
91	5.075E-05	7.041E-05	2.748E-05	1.852E-05	5.327E-08	1.783E-04	1.783E-04
92	1.100E-11	2.483E-05	0.0	3.028E-06	4.015E-07	2.80dE-05	2.80dE-05
93	0.0	9.292E-10	0.0	0.933E-25	1.334E-09	1.334E-09	1.334E-09
94	0.0	0.0	0.0	0.0	0.005E-20	0.005E-20	0.005E-20
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99	0.0	4.419E-09	9.235E-06	7.039E-12	2.884E-07	9.527E-06	9.527E-06
100	7.140E-22	0.010E-13	5.542E-09	1.037E-09	4.300E-06	4.307E-06	4.307E-06

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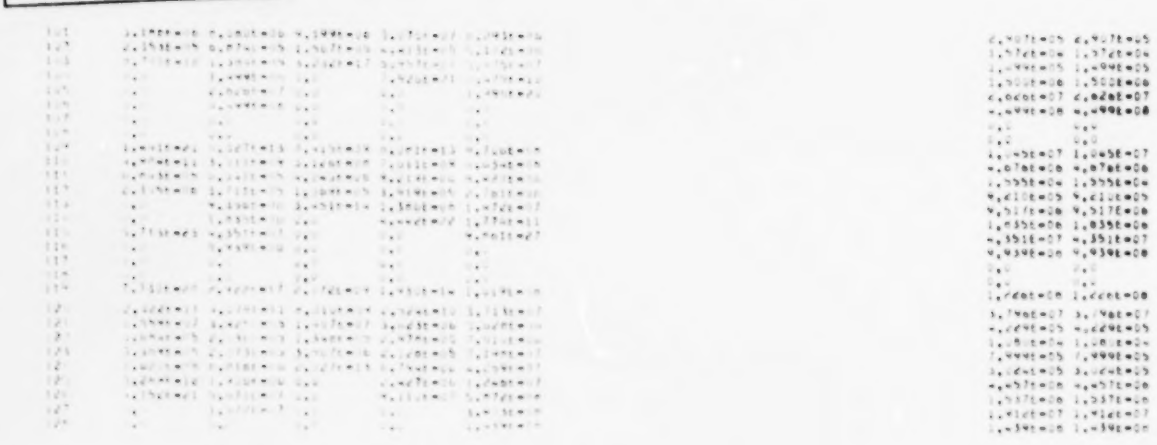
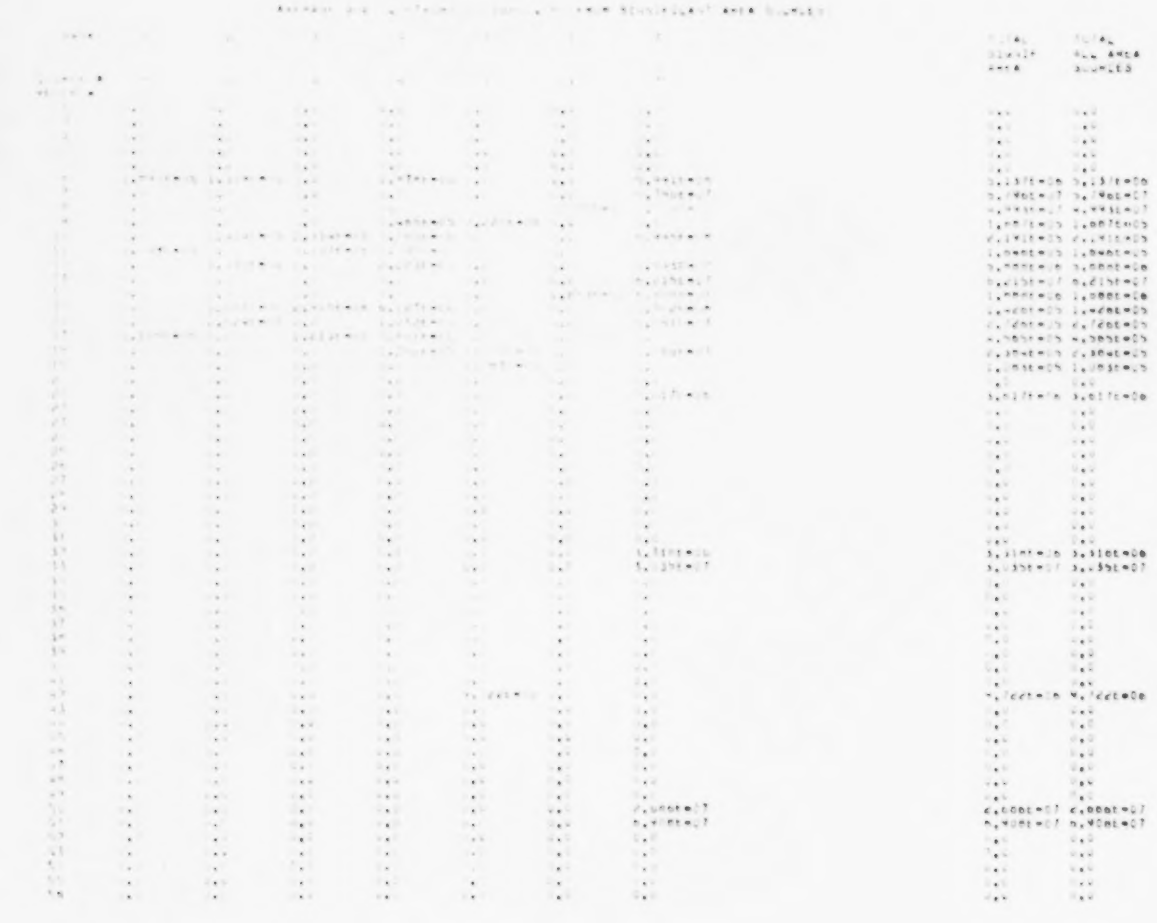




57	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67	0.0	0.0	0.0	0.0	0.0	2.942E-06	0.0	2.942E-06	2.942E-06
68	0.0	0.0	0.0	0.0	0.0	2.247E-07	5.063E-07	7.310E-07	7.310E-07
69	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	7.791E-07	9.300E-07	1.308E-06	0.0	0.0	7.780E-08	3.094E-06	3.094E-06
76	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81	0.0	0.0	0.0	0.0	0.0	6.912E-08	0.0	6.912E-08	6.912E-08
82	0.0	0.0	0.0	0.0	0.0	6.481E-07	0.0	6.481E-07	6.481E-07
83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90	0.0	0.0	0.0	0.0	0.0	2.112E-07	0.0	2.112E-07	2.112E-07
91	0.0	0.0	0.0	0.0	0.0	5.569E-07	1.400E-08	5.710E-07	5.710E-07
92	0.0	2.335E-06	0.0	1.127E-06	0.0	0.0	2.663E-07	3.729E-06	3.729E-06
93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
101	0.0	0.0	0.0	0.0	0.0	3.493E-07	0.0	3.493E-07	3.493E-07
102	0.0	0.0	0.0	0.0	0.0	3.472E-07	2.149E-07	5.621E-07	5.621E-07
103	0.0	1.380E-06	0.0	1.471E-06	0.0	0.0	1.575E-07	3.008E-06	3.008E-06
104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
106	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
108	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
109	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
111	0.0	0.0	0.0	0.0	0.0	4.098E-07	0.0	4.098E-07	4.098E-07
112	0.0	0.0	0.0	0.0	0.0	2.705E-07	2.922E-07	5.627E-07	5.627E-07
113	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
116	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
122	0.0	0.0	0.0	0.0	0.0	8.430E-07	1.822E-07	1.025E-06	1.025E-06
123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
127	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
128	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[illegible]

hour	minimum pressure (mb)	time (GMT)	stability class
1	000.00	479.00	3
2	000.00	479.00	3
3	000.00	479.00	3

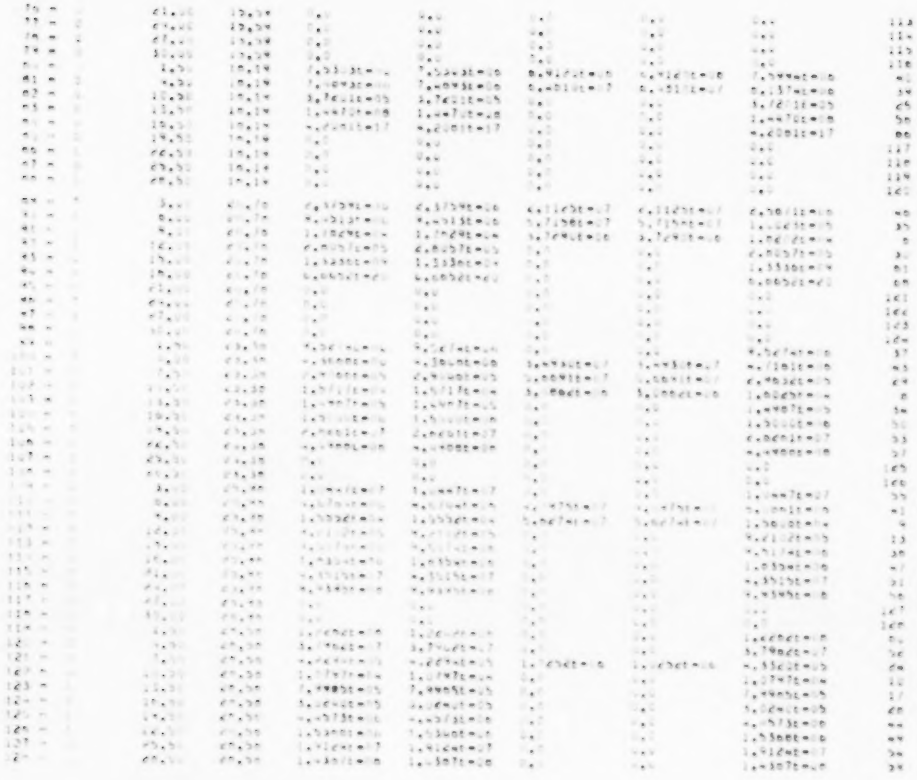
station no.	hour	wind direction (deg)	wind speed (m/s)
	1	000.00	0.00
	2	000.00	0.00
	3	0.00	0.00
2	1	0.00	0.00
	2	0.00	0.00
	3	0.00	0.00
3	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
4	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
5	1	0.00	0.00
	2	0.00	0.00
	3	0.00	0.00
6	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
7	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
8	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
9	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
10	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
11	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
12	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
13	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
14	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
15	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
16	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
17	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
18	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
19	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
20	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
21	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
22	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
23	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00
24	1	000.00	0.00
	2	0.00	0.00
	3	0.00	0.00

RESULTANT WIND CONDITIONS...

AVERAGE TEMP=0.0 DEG.CC TOTAL STABILITY 2

STATION NO.	WIND DIRECTION	WIND SPEED	AVG. WIND SPEED	WIND PERSISTANCE
1	175.00	2.42	4.00	0.000
2	150.34	2.36	4.00	0.590
3	149.47	2.82	4.00	0.705
4	112.01	2.31	3.67	0.629
5	172.03	2.72	4.67	0.583
6	175.00	2.42	4.00	0.604
7	140.26	2.09	3.33	0.628
8	119.53	3.14	4.67	0.672
9	90.00	4.33	4.33	1.000
10	119.54	2.54	4.00	0.635
11	146.03	2.72	4.67	0.583
12	200.00	5.67	5.67	1.000
13	200.00	5.67	5.67	1.000
14	150.34	2.36	4.00	0.590
15	74.16	3.01	4.00	0.901
16	90.00	5.33	5.33	1.000
17	90.00	5.00	5.00	1.000
18	150.34	2.36	4.00	0.590
19	145.04	3.09	4.00	0.772
20	200.00	5.67	5.67	1.000
21	200.00	5.67	5.67	1.000
22	146.24	2.26	5.67	1.000
23	4.30	4.00	0.00	1.000
24	119.54	2.54	4.00	0.635
25	208.04	5.05	4.00	0.987

RECEPTOR NO.	LAT	LONG	TOTAL FROM SINGLE POINT SOURCES	TOTAL FROM ALL POINT SOURCES	TOTAL FROM SINGLE AREA SOURCES	TOTAL FROM ALL AREA SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	37.00	87.00	0.0	0.0	0.0	0.0	0.0	89
2	37.00	87.00	0.0	0.0	0.0	0.0	0.0	90
3	37.00	87.00	5.86108E-11	5.86108E-11	0.0	0.0	5.86108E-11	82
4	37.00	87.00	9.18488E-13	9.18488E-13	0.0	0.0	9.18488E-13	84
5	37.00	87.00	5.61976E-06	5.61976E-06	0.0	0.0	5.61976E-06	6
6	37.00	87.00	5.47808E-05	5.47808E-05	5.18716E-08	5.18716E-08	5.47860E-05	4
7	37.00	87.00	6.05087E-05	6.05087E-05	9.77981E-07	9.77981E-07	6.15865E-05	3
8	37.00	87.00	1.42008E-05	1.42008E-05	4.99384E-07	4.99384E-07	1.52402E-05	11
9	37.00	87.00	2.42831E-06	2.42831E-06	1.08867E-05	1.08867E-05	1.30950E-05	12
10	37.00	87.00	6.37476E-06	6.37476E-06	6.19038E-05	6.19038E-05	6.82786E-05	5
11	37.00	87.00	1.93053E-05	1.93053E-05	1.09083E-05	1.09083E-05	2.85544E-05	7
12	37.00	87.00	4.17458E-05	4.17458E-05	1.60683E-05	1.60683E-05	5.78141E-05	2
13	37.00	87.00	9.01591E-06	9.01591E-06	5.88842E-08	5.88842E-08	9.10475E-06	8
14	37.00	87.00	1.01396E-05	1.01396E-05	8.61511E-07	8.61511E-07	1.10051E-05	10
15	37.00	87.00	5.06242E-05	5.06242E-05	1.88842E-08	1.88842E-08	5.06431E-05	14
16	37.00	87.00	3.42999E-06	3.82999E-06	1.44509E-05	1.44509E-05	4.44809E-06	13
17	37.00	87.00	3.53726E-05	3.53726E-05	6.72758E-05	6.72758E-05	6.23484E-05	23
18	37.00	87.00	6.11848E-06	6.11848E-06	4.58067E-05	4.58067E-05	5.17082E-05	22
19	37.00	87.00	6.67176E-06	6.67176E-06	2.36394E-05	2.36394E-05	2.90911E-05	9
20	37.00	87.00	1.53787E-05	7.53787E-05	1.40838E-05	1.40838E-05	8.59211E-05	16
21	37.00	87.00	7.49937E-05	7.49937E-05	0.0	0.0	7.49937E-05	15
22	37.00	87.00	1.56226E-06	1.56226E-06	3.81717E-06	3.81717E-06	4.43980E-06	44
23	37.00	87.00	2.45726E-19	2.45726E-19	0.0	0.0	2.45726E-19	83
24	37.00	87.00	0.0	0.0	0.0	0.0	0.0	71
25	37.00	87.00	0.0	0.0	0.0	0.0	0.0	72
26	37.00	87.00	0.0	0.0	0.0	0.0	0.0	73
27	37.00	87.00	0.0	0.0	0.0	0.0	0.0	74
28	37.00	87.00	0.0	0.0	0.0	0.0	0.0	75
29	37.00	87.00	0.0	0.0	0.0	0.0	0.0	76
30	37.00	87.00	0.0	0.0	0.0	0.0	0.0	77
31	37.00	87.00	0.0	0.0	0.0	0.0	0.0	78
32	37.00	87.00	0.0	0.0	0.0	0.0	0.0	79
33	37.00	87.00	5.47908E-11	5.47908E-11	3.61177E-10	3.61177E-10	3.81982E-10	45
34	37.00	87.00	1.78168E-05	1.78168E-05	5.03488E-07	5.03488E-07	1.83516E-05	26
35	37.00	87.00	0.0	0.0	0.0	0.0	0.0	80
36	37.00	87.00	0.0	0.0	0.0	0.0	0.0	81
37	37.00	87.00	0.0	0.0	0.0	0.0	0.0	82
38	37.00	87.00	0.0	0.0	0.0	0.0	0.0	83
39	37.00	87.00	0.0	0.0	0.0	0.0	0.0	84
40	37.00	87.00	0.0	0.0	0.0	0.0	0.0	85
41	37.00	87.00	0.0	0.0	0.0	0.0	0.0	86
42	37.00	87.00	0.0	0.0	0.0	0.0	0.0	87
43	37.00	87.00	2.78177E-07	2.78177E-07	4.77224E-06	4.77224E-06	4.92051E-06	38
44	37.00	87.00	0.0	0.0	0.0	0.0	0.0	88
45	37.00	87.00	0.0	0.0	0.0	0.0	0.0	89
46	37.00	87.00	0.0	0.0	0.0	0.0	0.0	90
47	37.00	87.00	0.0	0.0	0.0	0.0	0.0	91
48	37.00	87.00	0.0	0.0	0.0	0.0	0.0	92
49	37.00	87.00	0.0	0.0	0.0	0.0	0.0	93
50	37.00	87.00	0.0	0.0	0.0	0.0	0.0	94
51	37.50	87.00	5.05534E-05	5.05534E-05	2.69957E-07	4.68557E-07	6.03231E-05	19
52	37.50	87.00	6.51178E-06	6.51178E-06	6.90811E-07	6.90811E-07	2.51801E-06	5
53	37.50	87.00	1.71131E-06	1.71131E-06	0.0	0.0	1.71131E-06	46
54	37.50	87.00	0.0	0.0	0.0	0.0	0.0	95
55	37.50	87.00	0.0	0.0	0.0	0.0	0.0	96
56	37.50	87.00	0.0	0.0	0.0	0.0	0.0	97
57	37.50	87.00	0.0	0.0	0.0	0.0	0.0	98
58	37.50	87.00	0.0	0.0	0.0	0.0	0.0	99
59	37.50	87.00	0.0	0.0	0.0	0.0	0.0	100
60	37.50	87.00	0.0	0.0	0.0	0.0	0.0	101
61	37.50	87.00	0.0	0.0	0.0	0.0	0.0	102
62	37.50	87.00	0.0	0.0	0.0	0.0	0.0	103
63	37.50	87.00	0.0	0.0	0.0	0.0	0.0	104
64	37.50	87.00	0.0	0.0	0.0	0.0	0.0	105
65	37.50	87.00	0.0	0.0	0.0	0.0	0.0	106
66	37.50	87.00	5.05534E-05	5.05534E-05	2.99188E-06	2.99188E-06	5.94201E-05	20
67	37.50	87.00	1.03431E-04	1.03431E-04	7.81038E-07	7.81038E-07	1.04161E-04	11
68	37.50	87.00	1.88042E-12	1.88042E-12	0.0	0.0	1.88042E-12	93
69	37.50	87.00	1.70194E-16	1.70194E-16	0.0	0.0	1.70194E-16	85
70	37.50	87.00	0.0	0.0	0.0	0.0	0.0	108
71	37.50	87.00	0.0	0.0	0.0	0.0	0.0	109
72	37.50	87.00	0.0	0.0	0.0	0.0	0.0	110
73	37.50	87.00	0.0	0.0	0.0	0.0	0.0	111
74	37.50	87.00	0.0	0.0	0.0	0.0	0.0	112
75	0.00	0.00	9.81248E-05	9.81248E-05	3.09258E-06	3.09258E-06	1.01122E-04	12



APPENDIX B

USER'S GUIDE TO SCIM MODIFICATIONS

B.1 DESCRIPTION OF INPUT TO SCIM

B.2 FORTRAN IV PROGRAM LISTING

B.3 TEST CASE

(TO BE USED AS APPENDIX A IN SCIM USER'S MANUAL)

B.1 Description of Input to SCIM

Card Input Sequence

The card input sequence is, essentially, a superset of that of the pre-modification program; the modifications and the additional "keyword packages" required by the new version of SCIM, along with a restatement of the familiar control parameters, will be given as follows:

B.1.1 PARAMETERS

Allows the modification of program parameters or run options. Parameters or option variables are set to default values at compile time and, hence, only those which are to be modified need be entered. The format of the data package itself is FORTRAN IV namelist input with the name &INGRID.

The specific method used is selected through combinations of the parameters LTHETA, THETA, FACT, NOFACT, POWER and RADIUS.

1) Inverse distance power law: Set THETA to 360. and POWER to the desired value. All other parameters are allowed to assume default values.

2) Selective Angle Method: Set THETA and POWER to default or desired values. Other parameters assume default values.

3) Selective Radius Method: Select non-zero RADIUS value, THETA = .FALSE., and POWER. The other parameters may assume default values.

4) Weighting Factor Matrix: Set NOFACT = .FALSE. and specify weighting factor array, FACT, according to format below. This method must be used in conjunction with one of the three methods above.

The format of a 'PARAMETERS' package is

FIRST CARD

Columns	Contents	Format	Description
1-10	'PARAMETERS'		
21-70	TITLE	12A4,A2	Run heading for printing

SECOND CARD

Columns	Contents	Format	Description
2-8	'&INGRID'		

FOLLOWING CARDS

Columns	Contents	Format	Description
			Parameters to be initialized by FORTRAN. Namelist &INGRID; these parameters are:

Name	Type	Dimension	Default	Description
ORIGIN	R*4	2	(0.,0.)	Origin of weighting grid system
NX	I*4	-	1	Number of cells of the weighting grid system (X direction)
NY	I*4	-	1	Number of cells of the weighting grid system (Y direction)
GX	R*4	-	1.0	The east-west dimension each cell of the weighting grid
GY	R*4	-	1.0	The north-south dimension of each cell of the weighting grid
THETA	R*4	-	45.0	The search angle used in determining the wind direction and wind speed at a location
FACT	R*4	10,10,10	1000*1.0	The weighting factors utilized in determining the wind direction and wind speed at a location
NOFACT	L*4	-	.TRUE.	.TRUE. if no weighting factors are specified

Name	Type	Dimension	Default	Description
LTHETA	L*4	-	.TRUE.	.TRUE. if search angle used.
POWER	R*4	-	2.	Power law for inverse distance weighting
RADIUS	R*4	-	1.	Radius for selective radius method.

LAST CARD

Columns	Contents	Format	Description
2-5	'&END'		

B.1.2 STATIONS

This "keyword card" initiates the reading of the station locations, in kilometers, and station heights, in meters.

If either more than 10 stations have been specified or the stations are out of sequence, an appropriate error message is issued and the job is terminated. Finally, multi-station mode is indicated if the number of stations is greater than 1.

FIRST CARD

Columns	Contents	Format	Description
18	'STATIONS'		
21-70	TITLE	12A4,A2	Run heading for printing

FOLLOWING CARDS

Columns	Variable	Format	Description
6-10	NO	I5	Station identification number
11-20	X	E10.0	Station east-west coordinate (kilometers)
21-30	Y	E10.0	Station north-south coordinate (kilometers)
31-40	Z	E10.0	Station height (meters)
41-70	STAID	7A4,A2	Optional 30 character station identification

LAST CARD

Columns	Contents	Format	Description
1-5	'99999'		Delimiter card

Note that the location of the NOAA station, i.e., the one with the WBAN observations, must appear first.

B.1.3 WEIGHTS

This "keyword card" initiates the reading of the weighting factors which are subsequently used in computing the wind direction and wind speed at a specific location. These factors are specified on a grid cell by grid cell basis, i.e., from each of the - up to 10 - previously specified stations to each of the - up to 100 (10 x 10) - grid cells. Only those factors which are not 1.0 should be specified since 1.0 is the default value of all of the weighting factors.

FIRST CARD

Columns	Contents	Format	Description
1-7	'WEIGHTS'		
21-70	TITLE	12A4,A2	Run heading for printing

FOLLOWING CARDS

Columns	Variable	Format	Description
6-10	NO	I5	Station identification number
11-15	IX	I5	Horizontal (row) grid cell number
16-20	IY	I5	Vertical (column) grid cell number
21-30	FIELD	E10.0	Station-to-grid cell weight (normally between 0.0 and 1.)

LAST CARD

Columns	Contents	Format	Description
1-5	'99999'		Delimiter card

Non-unity weighting factors would normally be used to incorporate the knowledge of the representativeness of data as affected by topographic features such as hills and valleys. Moreover, they may also be used to express the confidence one has in the validity of a station's measurements. For example, if in a group of stations there existed only one National Weather Service station, this station would, on a grid cell basis, be assigned a value of, perhaps 2.0, whereas the remainder of the stations would be assigned a value of 0.5.

B.1.4 SCIM

This "keyword card" initiates the calling of subroutine SCIM (formerly the main program) and, therefore, from this point, the program flow and related input proceed essentially as before.

FIRST CARD

Columns	Contents	Format	Description
1-4	'SCIM'		
18-20	NMAX	I3	Number of iterations used in computing travel distance
21-70	TITLE	12A4,A2	Optional run heading for printing

For clarity, all of the input requirements will be restated and any additions will be shown where needed.

B.1.4.1 Model Inputs

The normal model input data includes the following:

- Control parameters specified on punched cards,
- Average pollutant emission rates for all point and area sources in a binary data file,
- The locations for which pollutant concentration estimates are desired on punched cards,

- WBAN hourly surface observations in National Weather Records Center (NOAA) Deck 144 format, as a card image file,
- Hourly wind direction and wind speed surface observations which supplement the WBAN hourly surface observations (only required for multi-station cases), as a card image file, and
- 00Z and 12Z estimates of the height of the mixing layer in a binary data file.

The formats for these data are shown in Table B-1 (A-F).

B.1.4.1.1 Control Parameters

The SCIM program estimates the air quality characteristics of a specified location by calculating hourly concentrations for a selected sample of hours. The user specifies how this sample is drawn by selecting the first hour, the last hour, and the time increment between other selected hours, as indicated in Table B-1(A). The sampling increment should be an odd number so that the selected hours will be rotated around the clock and all hours of the day will be nearly equally represented in the selected sample. If three-hourly meteorological data is being used, the sampling increments should be an odd number multiple of three. The sampling increments should be small enough that a sample of significant size is drawn.

The day of the week of the first hour to be selected is specified using 1 for Monday, 2 for Tuesday, etc. The day of the week for other selected hours is computed by the program.

A pollutant decay constant may be specified to indicate the rate at which the pollutant is depleted from the air by one or more physical or chemical processes. If the decay constant is specified to be zero or left blank, the program assumes no decay occurs. The decay constant (K) is related to pollutant half-life (i.e., T, the time required for 50 percent of the released pollutant to be depleted) by

$$K = \frac{0.693}{T}$$

The remaining control parameters (listed in Table B-1(A)) refer to characteristics of the city or other areas being represented. If the

area is built up and primarily urban in nature, the McElroy-Pooler diffusion functions should be specified (i.e., ISIGD=1). Otherwise, the Pasquill-Gifford diffusion functions are appropriate (i.e., ISIGD=2). The latitude is needed to estimate the effect of the sun's elevation on atmospheric stability (i.e., Pasquill-Turner stability class). The height of the anemometer from which the reported wind speeds are measured is used in estimating vertical wind speed profiles. The relative roughness of the area should be used to determine the three wind profile power law exponents. For unstable conditions (i.e., Pasquill-Turner stability classes 1, 2 and 3) a value of 0.1 is appropriate. For neutral and stable conditions appropriate values will depend on how built up the city structures are. For very built up cities (e.g., New York City and Chicago) values of 0.15 and 0.2 are appropriate for neutral and stable conditions, respectively (e.g., Singer, et.al., 1972). For less built up cities (e.g., St. Louis) a comparison of Pasquill-Turner stability classes and profile power law exponents determined from three measuring heights on a 500 foot tower showed that 0.2 and 0.3 are appropriate for neutral and stable conditions. For more rural sites, higher values may be appropriate (e.g., DeMarrais 1959). The annual mean mixing layer heights are default values which are used if the mixing layer heights corresponding to the day of the first selected hour are missing. After the first day, the last preceding 00Z (Greenwich time) or 12Z mixing layer height is used for a missing value. A background concentration may be specified which will be added to the concentration calculated for each receptor location. The practice of adding a constant background level seems to be particularly appropriate in treating concentrations of particulates.

B.1.4.1.2 Average Pollutant Emission Data File

The emission data file consists of five records as indicated in Table B-1(B). The emissions are represented by an area source and a number of point sources. The first four records are used to describe the area source emissions. The fifth record is used to describe the point sources.

The area source emissions are estimated at points within one to three gridworks. The use of three gridworks allows a fine mesh to be used for central city areas and two less fine mesh grids to be used for surrounding urban and suburban areas. Emissions may be defined for 1 to 5 heights at each point within each gridwork. The number of heights used is fixed for each gridwork. Emission rates for points other than grid points are estimated within the program by interpolation.

The first record of the emission data file describes the area source heights (1 to 5 may be specified), the location, dimensions and number of heights used for each gridwork. The location of each gridwork is defined by the lower left corner. Since each grid point is the center of a grid square, the lower left corner of the gridwork is one half grid distance less in both x and y than the lower left grid point. The area source heights must be listed from lowest to highest. The number of heights indicated for each gridwork should correspond to the highest height used. If the listed heights are 20, 40, 60, 80 and 100, and for the outer gridwork the highest height used for a grid point is 40, then the number of heights for the outer gridwork is 2. If only two gridworks are used, the parameters for the outer gridwork should be equal to the parameters for the middle gridwork, and record 4 should contain two zero values. If only one gridwork is used, the parameters for the outer and middle gridworks should be equal to the parameters for the inner gridwork, and records 3 and 4 will each consist of two zeros. The emission rates for each grid must be ordered in such a way that they change first with x, next with y, and last with source height.

The information required for each point source includes location (i.e., x and y coordinates in meters), stack height, emission rate, stack exit diameter, stack gas exit speed, and stack gas exit temperature. In addition, parameters which specify standard industrial code (SIC), location and political jurisdiction are carried to permit interface with the IPP package.

B.1.4.1.3 Receptor Locations, Mixing Height Data File and Hourly Weather Observations Data File

The receptor locations are specified on punched cards in the format indicated in Table B-1(C). The present version of the program will

accept up to 130 locations. The program would have to be modified slightly to accept a greater number of receptors.

A binary data file which gives the mixing height at 00Z (Greenwich Time) and 12Z for all available days in the chronological data period must be established. The format for this data is given in Table B-1(D).

A chronological data file of hourly (or 3-hourly) surface weather observations must be established. This is to be a card image file in the NOAA National Weather Records Center Deck 144 Format for WBAN hourly surface observations (defined in Table B-1(E)). A standard utility program may be used to transpose the information from the punched card deck to the card image data file.

B.1.4.1.4 Supplementary Hourly Wind Direction and Wind Speed Data File (Required for Multi-Station Cases)

A chronological data file of hourly (or 3-hourly) surface wind direction and wind speed observations must be established for each of the supplemental stations (i.e., those over and above the station having the WBAN surface observations) required by multi-station SCIM runs. This card image file is defined in Table B-1(F).

It should be noted that the wind direction and wind speed data for the supplemental stations must be specified in the same order as the station locations appear; also, that this card image file is unit 11. It should also be stated that, in multi-station mode (internal variable MULTI=.TRUE., i.e., more than one station's locations have been specified), if any of the stations (including the NOAA station) for a given hour have zero wind speeds, an error message stating that - REQUESTED INPUT DATA NOT FOUND for the specified year, month, day and hour is issued and the hour's data is ignored.

TABLE B-1

FORMATS FOR SCIM INPUT DATA

A. Control Parameters on Punched Card

Column	Format	Description
1-8	4I2	Year, month, day and hour of first input record
9-16	4I2	Year, month, day and hour of last input record
17-19	I3	Sampling increment (hours)
20	I1	Day of week (index) of first input hour
21-28	E8.3	Pollutant decay constant (per sec)
29	I1	Diffusion function option* 1=McElroy-Pooler functions based on Pasquill-Turner stability classes 2=Pasquill-Gifford functions based on Pasquill-Turner stability classes
30-34	F5.2	Latitude (degrees)
35-38	F4.1	Anenometer height (m)
39-41	F3.2	Wind profile power law exponent for unstable atmosphere
42-44	F3.2	Wind profile power law exponent for neutral atmosphere
45-47	F3.2	Wind profile power law exponent for stable atmosphere
48-52	I5	Annual mean mixing layer height for 12Z
53-57	I5	Annual mean mixing layer height for 00Z
58-62	F5.1	Background concentration, $\mu g/m^3$

*Other functions may be added with appropriate program modifications.

TABLE B-1

B. Average Pollutant Emission Rates (Binary Data File)

Record	Position	Format	Description	
1	1	Integer	Number of area source heights (NH)	
1	2 to NH+1	FP*	Effective area source heights (meters)	
1	NH+2	FP	Smallest x coordinate (m)	
1	NH+3	FP	Smallest y coordinate (m)	
1	NH+4	FP	Number of grid squares in x direction (GXI)	Inner Area Source Grid
1	NH+5	FP	Number of grid squares in y direction (GYI)	
1	NH+6	FP	Length of grid square side (m)	
1	NH+7	Integer	Number of heights (NHI)	
1	NH+8 to NH+13	Mixed	Same as NH+2 to NH+7 for Middle Area Source Grid	
1	NH+14 to NH+19	Mixed	Same as NH+2 to NH+7 for Outer Area Source Grid	
1	NH+20	Integer	Air Quality Control Region Number	
1	NH+21	Integer	Type of pollutant (1=SO_2, 2=Particulate)	
1	NH+22	Integer	Number of area source transformations (NSPAR)	
1	NH+23	Integer**	Index designating location in IPP Source File	
1	NH+24	FP	Fraction of an area source grid square which overlaps an IPP area source	
1	NH+25	Integer**	Index designating location in area source gridwork	
1	NH+26 to NH+25+5xNSPAR	Mixed	Same as NH+23 to NH+25, repeated for NSPAR-1 area source transformations	
1	NH+5xNSPAR+25	Integer	Number of IPP area sources (NAS)	
1	NH+5xNSPAR+26	Integer	Location parameter for first IPP area source	
1	NH+5xNSPAR+27	Integer**	Political jurisdiction of first IPP area source	
1	NH+5xNSPAR+28 to NH+25+5xNSPAR+2xNAS	Integer	Location parameter and political jurisdiction for remaining NAS-1 IPP area sources	
2	1	Integer	Number of emission rates in inner grid (i.e., NQI=NHIxGXIxGYI)	
2	2 to NQI+1	FP*	Emission rates for inner grid (g/m^2/sec)	
2	NQI+2	Integer**	Index designating IPP area source which overlaps first grid square	
2	NQI+3 to NQI+1+GXIxGYI	Integer**	Same as NQI+2 for remaining GXIxGYI inner grid squares	
3	1 to 1+(NBM+1)xGXMxGYM	Mixed	Same as record 2 except representing middle grid	
4	1 to 1+(NHO+1)xGXOxGYO	Mixed	Same as record 2 except representing outer grid	
5	1	Integer	Number of point sources (NPS)	
5	2	Integer**	Standard Industrial Code (SIC)	
5	3	Integer	IPP location parameter	
5	4	FP	x coordinate (m)	
5	5	FP	y coordinate (m)	
5	6	FP	Stack height (m)	
5	7	FP	Emission rate (g/sec)	
5	8	FP	Stack exit diameter (m)	First Point Source
5	9	FP	Stack gas exit speed (m/sec)	
5	10	FP	Stack gas exit temperature (°K)	
5	11	Integer**	Political jurisdiction	
5	12 to 10xNPS+1	Mixed	Same as 2 to 11 for remaining NPS-1 point source	

*FP means floating point.

**Designates a 2-byte integer, instead of a standard 4-byte integer.

TABLE B-1

FORMATS FOR SCIM INPUT DATA

C. Coordinates of Desired Concentration Estimates on Punched Cards (1 Card Per Receptor)

Column	Format	Description
1-8	F8.2	x coordinate (km)
9-16	F8.2	y coordinate (km)

D. Depth of Mixing Layer (Binary Data File, 1 Record for Each 12 Hours)

Position	Format	Description
1	FP*	Month
2	FP	Day
3	FP	Hour
4	FP	Depth of mixing layer (m)

*Floating point.

TABLE B-1

FORMATS FOR SCIM INPUT DATA

E. Hourly Surface Weather Observations (National Weather Records Center Deck 144 Format, 1 Card Per Hour)

Column	Format*	Description
1-5	I5	Station number
6-13	4I2	Year, month, day and hour
14-16	A3	Ceiling heights (hundreds of feet; XXX=unlimited; 888=cirriform ceiling of unknown heights)
17-20	4A1	Sky condition for layers 1 to 4 0 = clear 1 = thin scattered 2 = scattered 4 = thin broken 5 = broken 7 = thin overcast 8 = overcast Blank = partial obscuration X = obscuration
21-38	I5,8I1,I4,I3	Visibility, weather elements, sea level pressure and dew point (these codes not used by SCIM)
39-40	I2	Wind direction (tens of degrees)
41-42	I2	Wind speed (knots, X overpunch in column 41 indicates 100 or more knots)
43-46	I4	Station pressure (hundreths of in. of Hg.)
47-49	A3	Temperature (°F, X in column 47 indicates negative temperature)
53-55	I3	Relative humidity (percent)
56	A1	Total sky cover (tenths, X=10)
57-78	--	Cloud layer data (not used by SCIM)
79	A1	Total opaque sky cover (tenths, X=10)

*I designates integers only; A designates either or both numeric and alphabetic characters are used.

TABLE B-1

FORMATS FOR SCIM INPUT DATA

F. Hourly Surface Wind Direction and Wind Speed for Each Supplemental Station

Column	Format*	Description
6-13	4I2	Year, month, day and hour
20-21	I2	Wind direction, station 2 (tens of degrees)
22-23	I2	Wind speed, station 2 (knots)
25-26	I2	Wind direction, station 3 (tens of degrees)
27-28	I2	Wind speed, station 3 (knots)
30-31	I2	Wind direction, station 4 (tens of degrees)
32-33	I2	Wind speed, station 4 (knots)
35-36	I2	Wind direction, station 5 (tens of degrees)
37-38	I2	Wind speed, station 5 (knots)
40-41	I2	Wind direction, station 6 (tens of degrees)
42-43	I2	Wind speed, station 6 (knots)
45-46	I2	Wind direction, station 7 (tens of degrees)
47-48	I2	Wind speed, station 7 (knots)
50-51	I2	Wind direction, station 8 (tens of degrees)
52-53	I2	Wind speed, station 8 (knots)
55-56	I2	Wind direction, station 9 (tens of degrees)
57-58	I2	Wind speed, station 9 (knots)
60-61	I2	Wind direction, station 10 (tens of degrees)
62-63	I2	Wind speed, station 10 (knots)

*I designates integers only.

```
C
C     MAIN                                                              JUNE'75
C                                                                       JUNE'75
      INTEGER KEY0(11)/'READ','STAT','NEIG','SCIM'/,KEY/,               JUNE'75
     #   KEY(5),TITLE(13)                                               JUNE'75
   10 READ(5,9010,END=9000) KEY,NMAX,TITLE                              JUNE'75
 9010 FORMAT(5A4,11A,I3,12A4,A2)                                        JUNE'75
      DO 20 I=1,4                                                       JUNE'75
      IF(KEY(1).EQ.KEY0(I)) GO TO 30                                    JUNE'75
   20 CONTINUE                                                          JUNE'75
      WRITE(6,6020) KEY(1)                                              JUNE'75
 6020 FORMAT(1H0,'INVALID KEYWORD ',A4/'1','EXECUTION TERMINATED.')     JUNE'75
      STOP 1                                                            JUNE'75
   30 WRITE(6,6030) KEY,TITLE                                           JUNE'75
 6030 FORMAT('1',/,5A4/,12A4,A2///)                                     JUNE'75
      GO TO (100,200,300,400),I                                         JUNE'75
  100 CALL INPAR                                                        JUNE'75
      GO TO 10                                                          JUNE'75
  200 CALL INSTA                                                        JUNE'75
      GO TO 10                                                          JUNE'75
  300 CALL WEIGHT                                                       JUNE'75
      GO TO 10                                                          JUNE'75
  400 IF(NMAX.EQ.0) NMAX=1                                              JUNE'75
      WRITE(6,6400) NMAX                                                JUNE'75
 6400 FORMAT('0',/,'0','MAX NUMBER OF ITERATIONS USED IN COMPUTING TRAVEL',JUNE'75
     #   ' DISTANCE IS ',I3//)                                          JUNE'75
      CALL SCT(NMAX)                                                    JUNE'75
      GO TO 10                                                          JUNE'75
 9000 WRITE(6,9001)                                                     JUNE'75
 9001 FORMAT('0END OF PROGRAM.')                                        JUNE'75
      STOP                                                              JUNE'75
      END                                                               JUNE'75


      SUBROUTINE INPAR                                                  JUNE'75
      COMMON /GRID/ DMIGIN(2),NX,NY,DX,DY,ALPHA,THETA,RADIUS,POWER      JUNE'75
      LOGICAL NOFACT,THETA                                              JUNE'75
      COMMON /FACTOR/ FACT(10,10,10),NOFACT                             JUNE'75
      NAMELIST /INGRID/ ORIGIN,NX,NY,DX,DY,THETA,FACT,NOFACT,           JUNE'75
     #   ALPHA,RADIUS,POWER                                             JUNE'75
      REAL THETA/0.0/                                                   JUNE'75
      LOGICAL TRUE                                                      JUNE'75
      DATA TRUE/.TRUE./                                                 JUNE'75
      RADIUS=1.0                                                        JUNE'75
      POWER=2.0                                                         JUNE'75
      READ(5,INGRID)                                                    JUNE'17
      IF(NX.LT.1.OR.NX.GT.10.OR.NY.LT.1.OR.NY.GT.10) GO TO 900          JUNE'75
      WRITE(6,6010) ORIGIN,NX,NY,DX,DY,      NOFACT,POWER               JUNE'75
 6010 FORMAT('1',/,'0','GRID (',F7.2,',',F7.2,')'//'0',T21,             JUNE'75
     #                 'BEGINNING GRID X=',I2,T51,'WEIGHTING GRID X=',  JUNE'75
     #   I2/'0',T21,'BEGINNING GRID Y=',I2,T51,'WEIGHTING GRID Y=',     JUNE'75
     #   F5.2/'0',T21,'NO WEIGHTING FACTORS ('/'0',I2,')',T51,          JUNE'75
     #   'POWER=',F4.1)                                                 JUNE'75
      IF(.NOT.THETA) WRITE(6,6011) THETA                                JUNE'75
      IF(.NOT.THETA) WRITE(6,6012) RADIUS                               JUNE'75
 6011 FORMAT('0',T21,'BEARING ANGLE=',F5.1)                             JUNE'75
 6012 FORMAT('0',T21,'BEARING RADIUS=',F7.2)                            JUNE'75
      ALPHA=ATAN2(1.0,1.0)/45.0                                         JUNE'75
      ALPHA=1.0                                                         JUNE'75
      RETURN                                                            JUNE'75
  900 WRITE(6,6100)                                                     JUNE'75
 6100 FORMAT('0',/,'GRID DIMENSIONS ARE OUT OF RANGE.'//T21,            JUNE'75
     #   'EXECUTION TERMINATED.')                                       JUNE'75
      STOP 1                                                            JUNE'75
      END                                                               JUNE'75


      SUBROUTINE INSTA                                                  JUNE'75
      INTEGER END,STAID(8)                                              JUNE'75
      LOGICAL * 1 T                                                     JUNE'75
      COMMON /STA/ PX(100),PY(100),WT(100),NSTA,MULT                    JUNE'75
      WRITE(6,6010)                                                     JUNE'75
 6011 FORMAT('1',/,'STATION NO.',T45,'X (KM)',T55,'Y (KM)',T65,         JUNE'75
     #   'WEIGHT (WT)',T105,'IDENTIFICATION'/)                          JUNE'75
      DO 100 NSTA=1,31                                                  JUNE'75
      READ(5,6020) END,NO,X,Y,Z,STAID                                   JUNE'75
 6020 FORMAT(A3,I3,2F10.0,F5.2,8A4)                                     JUNE'75
      IF(NO.NE.999) GO TO 200                                           JUNE'75
      IF(NSTA.EQ.1) GO TO 105                                           JUNE'75
      IF(T.AND.NSTA) GO TO 500                                          JUNE'75
      WRITE(6,6100) NO,X,Y,Z,STAID                                      JUNE'75
 6100 FORMAT('0',I3,T41,F8.2,T61,F8.2,T86,F8.1,T101,8A4,A2)             JUNE'75
      PX(NSTA)=X*1000.                                                  JUNE'75
      PY(NSTA)=Y*1000.                                                  JUNE'75
  100 WT(NSTA)=Z                                                        JUNE'75
  105 WRITE(6,6105)                                                     JUNE'75
 6105 FORMAT('0',/,'0',T21,'MORE THAN 30 STATIONS HAVE BEEN SPECIFIED.'/T21,JUNE'75
     #   'EXECUTION TERMINATED.')                                       JUNE'75
      STOP 1                                                            JUNE'75
  500 WRITE(6,6500) NO                                                  JUNE'75
 6500 FORMAT('0',/,'0',T21,'STATION NO.',I3,' IS OUT OF SEQUENCE.'/T21, JUNE'75
     #   'EXECUTION TERMINATED.')                                       JUNE'75
      STOP 1                                                            JUNE'75
  200 NSTA=NSTA-1                                                       JUNE'75
      CALL TRANSF(STA,6F,1                                              JUNE'75
      RETURN                                                            JUNE'75
      END                                                               JUNE'75
```

```
      SUBROUTINE WEIGHT                                                 JUNE'75
      INTEGER END                                                       JUNE'75
      LOGICAL WILT                                                      JUNE'75
      COMMON /PTS/ PX(100),PY(100),WT(100),NSTA,WILT                    JUNE'75
      LOGICAL NOFACT, THETA                                             JUNE'75
      COMMON /FACTOR/ FACT(10,10,10),NOFACT                             JUNE'75
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,THETA,(THETA,RADIUS,POWER     JUNE'75
      NOFACT=.FALSE.                                                    JUNE'75
      WRITE(6,6010)                                                     JUNE'75
 6010 FORMAT('0',T21,'STATION NO.',T41,'CELL NO. (X)',T61,'CELL NO. (Y)' JUNE'75
     A   ,T81,'WEIGHTING FACTOR')                                       JUNE'75
      DO 10 I=1,NF                                                      JUNE'75
      DO 10 J=1,NX                                                      JUNE'75
      DO 10 ISTA=1,NSTA                                                 JUNE'75
   10 FACT(ISTA,I,J)=1.0                                                JUNE'75
   20 READ(5,5020) END,NO,IX,IY,FIELD                                   JUNE'75
 5020 FORMAT(I1F10.0)                                                   JUNE'75
      IF(END.EQ.99999) GO TO 100                                        JUNE'75
      IF(NO.LT.1.OR.NO.GT.NSTA.OR.IX.LT.1.OR.IX.GT.NX.OR.IY.LT.1        JUNE'75
     X   .OR.IY.GT.NY) GO TO 500                                        JUNE'75
      FACT(NO,IX,IY)=FIELD                                              JUNE'75
      WRITE(6,6020) NO,IX,IY,FIELD                                      JUNE'75
 6020 FORMAT(1X6,I3,T40,I2,T66,I2,T80,F8.4)                             JUNE'75
      GO TO 20                                                          JUNE'75
  100 RETURN                                                            JUNE'75
  500 WRITE(6,6500)                                                     JUNE'75
 6500 FORMAT('0',T21,'INVALID INDEX (OR INDICES)'/T21,                  JUNE'75
     X   'EXECUTION TERMINATED.')                                       JUNE'75
      STOP 1                                                            JUNE'75
      END                                                               JUNE'75


      BLOCK DATA                                                        JUNE'75
      LOGICAL NOFACT, THETA                                             JUNE'75
      COMMON /FACTOR/ FACT(10,10,10),NOFACT                             JUNE'75
      DATA FACT/1000*1./,NOFACT/.TRUE./                                 JUNE'75
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,THETA,(THETA,RADIUS,POWER     JUNE'75
      DATA ORIGIN/0.,0./,GX,GY/2*1.0/,NX,NY/2*1/                        JUNE'75
      END                                                               JUNE'75


      SUBROUTINE LOCATE(NO,NS,E)                                        JUNE'75
      LOGICAL WILT                                                      JUNE'75
      COMMON /PTS/ PX(100),PY(100),WT(100),NSTA,WILT                    JUNE'75
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,ALPHA,(THETA,RADIUS,POWER     JUNE'75
      LOGICAL NOFACT, THETA                                             JUNE'75
      COMMON /FACTOR/ FACT(10,10,10),NOFACT                             JUNE'75
      COMMON /WORK/ WORK,WGT,WIND                                       JUNE'75
      REAL W(1),WGT(1),V(100),X(100),RLIST(100)                         JUNE'75
      INTEGER STA(100)                                                  JUNE'75
      LOGICAL WORK(1)                                                   JUNE'75
      NLIM=NSTA                                                         JUNE'75
      GO 20 ISTA=1,NSTA                                                 JUNE'75
      IF(W(ISTA).GT.0.0) RETURN 1                                       JUNE'75
C     CHANGE WIND SPEED FROM KNOTS TO M/SEC                             JUNE'75
      W(ISTA)=W(ISTA)*0.51479                                           JUNE'75
      IF(W(ISTA).LT.1.E-8.OR.W(ISTA).GE.30.) GO TO 10                   JUNE'75
C     CHANGE THE WIND DIRECTION FROM TRUE OF DEGREES TO RADIANS         JUNE'75
      W(ISTA)=W(ISTA)*0.174532Y                                         JUNE'75
      IF(W(ISTA).LT.-1.570796.OR.W(ISTA).GT.7.853982) GO TO 10          JUNE'75
C     RESOLVE ALL WIND SPEEDS AT ALL STATIONS TO 10 METERS              JUNE'75
      IF(WT(ISTA).GT.0.) W(ISTA)=W(ISTA)*(10./WT(ISTA))**POWER          JUNE'75
      V(ISTA)=W(ISTA)*SIN(W(ISTA))                                      JUNE'75
      V(ISTA)=W(ISTA)*COS(W(ISTA))                                      JUNE'75
      GO TO 20                                                          JUNE'75
   10 W(ISTA)=1.E+10                                                    JUNE'75
      V(ISTA)=1.E+10                                                    JUNE'75
      ACT=ACT+1                                                         JUNE'75
   20 CONTINUE                                                          JUNE'75
      IF(ACT.LE.0) RETURN 1                                             JUNE'75
      GT=ACT.GT.1                                                       JUNE'75
      RETURN                                                            JUNE'75
C                                                                       JUNE'75
C     - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - JUNE'75
C                                                                       JUNE'75
      ENTRY WEIGHT(NF,NY,THETA,UW)                                      JUNE'75
      WRITE(1,                                                          JUNE'75
      NEST=1                                                            JUNE'75
C                                                                       JUNE'75
C     DETERMINE THE WEIGHTING GRID CELL LOCATION OF THE RECEPTOR POINT  JUNE'75
C                                                                       JUNE'75
      IX=INT((PX-ORIGIN(1))/GX)+1                                       JUNE'75
      IY=INT((PY-ORIGIN(2))/GY)+1                                       JUNE'75
      IF(IX.LE.0.OR.IX.GT.NX.OR.IY.LE.0.OR.IY.GT.NY) GO TO 25           JUNE'75
      WKEY=.NOT.NOFACT                                                  JUNE'75
      GO TO 30                                                          JUNE'75
   25 WKEY=.FALSE.                                                      JUNE'75
   30 SIGU=0.                                                           JUNE'75
      SIGV=0.                                                           JUNE'75
      SIGR=0.                                                           JUNE'75
      DO 40 ISTA=1,NSTA                                                 JUNE'75
   40 STA(ISTA)=ISTA                                                    JUNE'75
C                                                                       JUNE'75
C     ORDER STATIONS BASED UPON MINIMUM RADIUS                          JUNE'75
C                                                                       JUNE'75
      DO 50 ISTA=1,NSTA                                                 JUNE'75
                                                                        JUNE'75
```

```
      90 RDIST(ISTA)=SQRT((RX-PX(ISTA))**2+(RY-PY(ISTA))**2)                    JUNE'79
         IF(GT) CALL SORTX(RDIST,STANC,NSTA)                                   JUNE'79
      60 DO 70 JSTA=NEXT,NSTA                                                  JUNE'79
         ISTA=STANC(JSTA)                                                      JUNE'79
         IF(ISTA.EQ.0.OR.U(ISTA).EQ.1.E+10.OR.V(ISTA).EQ.1.E+10) GO TO 70      JUNE'79
C                                                                              JUNE'79
C     SELECT FIRST STATION BASED UPON MINIMUM (AT THAT TIME) DISTANCE          JUNE'79
C                                                                              JUNE'79
         IF(NRFX) WFACT=WFACT(ISTA,IX,IY)                                      JUNE'79
         WEIGHT=WFACT/(RDIST(ISTA)**POWERX+1.E-06)                             JUNE'79
         SIGUSI=U(ISTA)**2*WEIGHT                                              JUNE'79
         SIGVSI=V(ISTA)**2*WEIGHT                                              JUNE'79
         SIGRSI=WEIGHT                                                         JUNE'79
         STANC(JSTA)=0                                                         JUNE'79
         IF(ISTA.LT.NSTA) GO TO 80                                             JUNE'79
      70 CONTINUE                                                              JUNE'79
         GO TO 190                                                             JUNE'79
      80 DX=PX(ISTA)-RX                                                        JUNE'79
         DY=PY(ISTA)-RY                                                        JUNE'79
         IF(DX.EQ.0..AND.DY.EQ.0.) GO TO 150                                   JUNE'79
         ALPHI=ATAN2(DY,DX)                                                    JUNE'79
         TXP=PX(ISTA)                                                          JUNE'79
         TYP=PY(ISTA)                                                          JUNE'79
         NEXT=JSTA+1                                                           JUNE'79
         DO 100 JSTA=NEXT,NSTA                                                 JUNE'79
         ISTA=STANC(JSTA)                                                      JUNE'79
         IF(ISTA.EQ.0) GO TO 190                                               JUNE'79
C                                                                              JUNE'79
C     SELECT ANY STATION WITHIN A SECTOR OF                                    JUNE'79
C     THETA DEGREES OF THE SELECTED STATION                                    JUNE'79
C                                                                              JUNE'79
         IF(.NOT.LIMTA) GO TO 90                                               JUNE'79
         DX2=PX(ISTA)-RX                                                       JUNE'79
         DY2=PY(ISTA)-RY                                                       JUNE'79
         ALPH2=ATAN2(DY2,DX2)                                                  JUNE'79
         IF(ABS(ALPH1-ALPH2).LT.ALPHA) STANC(JSTA)=0                           JUNE'79
         GO TO 100                                                             JUNE'79
C                                                                              JUNE'79
C     SELECT ANY STATION WITHIN A MINIMUM SEARCH RADIUS OF THE SELECTED        JUNE'79
C     STATION                                                                  JUNE'79
   90 IF(SQRT((TXP-PX(ISTA))**2+(TYP-PY(ISTA))**2).LE.RADIUS)                  JUNE'79
     +    STANC(JSTA)=0                                                       JUNE'79
C                                                                              JUNE'79
  100 CONTINUE                                                                 JUNE'79
      GO TO 60                                                                 JUNE'79
  190 CWSI=U/SIW                                                               JUNE'79
      CWSI=V/SIW                                                               JUNE'79
      CWSI=1./SIW                                                              JUNE'79
      THETA=ATAN2(CWSI,CWSI)                                                   JUNE'79
      UBAR=CWSI*COS(THETA)+CWSI                                                JUNE'79
      RETURN                                                                   JUNE'79
      END                                                                      JUNE'79


      SUBROUTINE SORTX(A,LOC,N)                                                JUNE'79
      DIMENSION A(1),LOC(1)                                                    JUNE'79
      M=N                                                                      JUNE'79
    1 M=M/2                                                                    JUNE'79
      IF(M.EQ.0) RETURN                                                        JUNE'79
      K=N-M                                                                    JUNE'79
      DO 10 J=1,K                                                              JUNE'79
      I=J                                                                      JUNE'79
    9 IM=I+M                                                                   JUNE'79
      IF(A(I).LE.A(IM)) GO TO 10                                               JUNE'79
      T=A(I)                                                                   JUNE'79
      A(I)=A(IM)                                                               JUNE'79
      A(IM)=T                                                                  JUNE'79
      LOCT=LOC(I)                                                              JUNE'79
      LOC(I)=LOC(IM)                                                           JUNE'79
      LOC(IM)=LOCT                                                             JUNE'79
      I=I-M                                                                    JUNE'79
      IF(I.GT.0) GO TO 9                                                       JUNE'79
   10 CONTINUE                                                                 JUNE'79
      GO TO 1                                                                  JUNE'79
      END                                                                      JUNE'79


      FUNCTION ANGARC(DELM,DELN)                                               00002820
C                     D. R. TURNER (ARFRD, CINCINNATI)                         00002830
C        DETERMINES APPROPRIATE ANGLE OF ARC(ANG) = M/N,                       00002840
C        NO COMMON REQUIREMENT, NO ARRAYS, USES LIBRARY FUNCTION ATAN2         00002850
      IF(DELN)11,2,3                                                           00002860
    1 IF(DELM)4,5,4                                                            00002870
    4 ANGARC = 57.2957*ATAN (DELM/DELN)+180.                                   00002880
      RETURN                                                                   00002890
    5 ANGARC=180.                                                              00002900
      RETURN                                                                   00002910
    2 IF(DELM)6,7,8                                                            00002920
    6 ANGARC=270.                                                              00002930
      RETURN                                                                   00002940
    7 ANGARC = 0.                                                              00002950
      RETURN                                                                   00002960
    8 ANGARC=90.                                                               00002970
      RETURN                                                                   00002980
    3 IF(DELM)9,10,11                                                          00002990
    9 ANGARC = 57.2957*ATAN (DELM/DELN)+360.                                   00003000
      RETURN                                                                   00003010
   10 ANGARC = 360.                                                            00003020
      RETURN                                                                   00003030
   11 ANGARC = 57.2957*ATAN (DELM/DELN)                                        00003040
      RETURN                                                                   00003050
C     ANGARC=360 INDICATES INDETERMINATE ANGLE                                 00003060
      END                                                                      00003070
```

```
      S UNCOUPLED MODE
C
      DIMENSION T(97),Z(200),ACCEL( 8,01,8910Z(200),PSPOIE( 8,01          ARFAS
     1,WA(5),,WA(5),DI(2000),QI(600),QD(1000),DC(17,13),S_W(6,15)        ARFAS
     EQUIVALENCE (DI(97),DC(1,1)),(B_W(1,1),QD(1))                       ARFAS
C
      COMMON/ANFAS/ST,NA,DI(97),ACCEL,9010Z,PSPOI,WA,,WA,2,QI,QD,CONC
C
      LOGICAL ...                                                        JUNE'79
      COMMON/BASIC/PATH,INTAB,IERR,IPIGO,NALIM,NBALM,NLI,BONF
     1,EMAX,CONA,DELAY,INDEX,TWTA,CIGMA,9IGY,9IGZ,XM,YM,ZM,XB,YB,XW,YW    BASIC
     2,INO,,LTA,WHAI,WWI,WAI,GXI,GYI,DLTAI,WMI,XMWM,YMWM,GXM,GYM,DLTAM,WMM  BASIC
     3,WWM,,WWM,,GXI,GYI,DLTAD,WWD,PTTP,ICASD,WAI,WAD,WA,WWM,WWPB,WB     BASIC
     4,IBIGI,NPIBT,WWPFP,IWPB,WBBOT,WGBTWP,,LOCAY                        JUNE'79
C
      DIMENSION YEARW(2),AMMWW(2),DAYY(2),MO_BB(2)
C
      COMMON/CATTOF /DM,STOP,YEARW,AMMW,DAYY,MO_BW
C
      DIMENSION PR(1),(130),CNCY(130),AMW(130),YBB(130),ZBW(130)          OUTPUT
C
      COMMON/OUTPUT/XEAM,AMUN,DAY,MOLB,WBECP,CNET,CPDIV,XMW,YBB,ZWB,100M
     1,TPBP,ALAT,PU,PA,PB,CIGM1,CIGM2,INEGW,BACKGD,INDP,,LINE,PWIDA      OUTPUT
C
      DIMENSION XP(680),YP(680),ZP(680),WP(680),BP(680),DP(680),VP(680)   POINTS
     1,TP(680),9910Y(5,680),,P01(5,680),CUMPT(680),CNCA(13000),WPPW(680)  POINTS
     2,TWTP(ERW2,WSTC(680),TP1(680)                                       POINTS
     EQUIVALENCE (XP(1),XP(1))                                            POINTS
C
      COMMON/POINTS/XP,YP,ZP,WP,BP,DP,VP,TP,WPBB,CONPS,INCMG,9910Y
     1,ASTC,WWDE,CONPT,TP1,,WPBW                                          POINTS
C
      COMMON/WORDP/WPT,,WWDT,PWIND
C
      LOGICAL ALLFT                                                      JUNE'79
      COMMON/PATH/ PATH1,PP(10),WT(10),WPTW,,LFT                         JUNE'79
C
C SET MAXIMUM ALLOWABLE INPUTS (UNCHANGED FOR N_A)
C NA    CREATES DIMENSION LIMIT OF 2 ARRAYS,
      NAT = 500
      NA = 2000
      NAP = 1000
C NWW  CREATES DIMENSION LIMIT OF UNA AND NA ARRAYS
      NWW = 5
C NWPB CREATES DIMENSION LIMIT OF XP , YP , ZP  AND DP ARRAYS,
      NWPB = 680
      IJKM = 5
      IWWM = 5
      IWWP = 10
      IWPP = 50
      IWPPP = 500
      IJSMX = 9000,
      NJI = 30
      NJ = IJKM*IWWP*IWWM
C
      WRITE(ICRT,1000)(AMMWW(I),WWWW(I),,GYY(I),MO_WW(I),I=1,2),DM,IJKM
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      DO 100 I=1,NPTS
      ZBAR(I) = 0.
  100 CONTINUE
      RETURN
      END

      SUBROUTINE DISTX
C ROUTINE TO SET DISTANCE (KMPS)FACT ARRAYS.
C
      DIMENSION DISTX(2801),XDCAY( 4401),SSIGZ(2801),FXPOZ( 6401)      AREA9
     1,XHAT(1),CHAT(1),CI(2000),ZI(6001,3U(10001)                      JUNE'75
C
      COMMON/AREA9/XXI,XX,DISTX,XDCAY,SSIGZ,FXPOZ,XM,XH,U,XX,0.01,GO,CONC
C
      COMMON/BASIC/IPRTU,ISTAR,IERR,ISIGD,XALIM,XAZLM,XLI,XONE
     1,RPAR,CONE,CBTAY,INJFR,TMTR,CIGMX,BIGY,BIGZ,XR,YR,ZR,XB,YB,ZB,XA      BASIC
     2,TAU,XLTA,XMAI,XMAI,GXI,GYI,DLTAI,XMI,XMAX,YMAX,GXM,GYM,DLTAM,XMM      BASIC
     3,XMAU,XMAO,GXO,GYO,DLTAO,XMDUF777,ICARD,XAI,XAO,XA,XMM,XMBB,XB         BASIC
     4,TBIG1,XFIRST,XMSTOP,IXMP,XGROUT,XGXTAB                                BASIC
C
      DIMENSION XP(6401),YP(6401),ZP(6401),HP(6401),DP(6401),UP(6401)  PDI*75
     1,TP(6401),SSIGYP,ZBAR),XLOC(6401),CONCP(6401),CNC4(13001),WPRP(6401)  PDI*75
     2,TSTOP=U/ XSTP(6401),IPJ(601)                                   PDI*75
      EQUIVALENCE (CNC4(1),DP(1))                                     PDI*75
C                                                                     PDI*75
      COMMON/PDIS75/XP,YP,ZP,HP,DP,UP,TP,XPSS,CONPS,IXCHG,SSIGY       PDI*75
     1,XSTP,XLOC,CONCP,IPJ,HPRP                                       PDI*75
C
      COMMON/WORDP/XRO,XHST,PAIR
C
      LOGICAL MULTT
      COMMON /DOSE/ PAT(10),PT(10),WT(10),XSTA,MULTI                  JUNE'75
      DIMENSION XF,PI DI 20 50                                        JUNE'75
      IXCHG = 0                                                       JUNE'75
C SET DISTX ARRAY
      DISTX(1)=XINF
      DO 20 I=2,NXL1P
      J = I - 1
      IF (IXCHG.NE.0) GO TO 15
      DISTX(I) = XINF
      IF(DISTX(J)+DLTA) GO TO 10                                      JUNE'75
      IXCHG = 1
   15 CONTINUE
      DISTX(I) = DISTX(J) + DLTA
   10 CONTINUE
      IF(DISTX(I),GT,XMAX) GO TO 25                                   JUNE'75
   20 CONTINUE
      NPTS = (XMAX + DISTX(NXL1M))/DLTA + 1.
      WRITE (IPRTU,1001) NM135,XMAX,DISTX(NXL1M)
 1001 FORMAT(1H0,' NONE LOCATIONS REQUESTED FOR DISTX ARRAY, XMAX =',
     1 F10.3,', DISTX(LAST)=',F10.3)
      CALL EXIT
   25 CONTINUE
      NPT = I
C SET AUGATS WHICH DEPEND ON DISTANCE AND METEOROLOGICAL CONDITIONS ONLY.
C CHECK THAT DIMENSION LIMIT NXZLM IS NOT EXCEEDED
      NM,IWRONG)
      IF(NM.LT.NXZLM) GO TO 26                                        JUNE'75
      WRITE (IPRTU,1002) NXZLM,NM,NXI
 1002 FORMAT(1H0,' NM = NXI      EXCEEDS DIMENSION LIMIT (P',I6,',   NM,6H',I
     16,',   NXI=',I6)
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      CALL EXIT
   20 CONTINUE
C GET TRAVEL DISTANCE DECAY FACTORS
   50 CONTINUE
      IF(DECAY.GT.0.) GO TO 44
      IF(IDIST.NE.0.OR..MULTI) GO TO 61                                  JUNE'79
      DO 43 IM=1,NMLT                                                    JUNE'79
      RDCAY(IM) = 1.
   43 CONTINUE
      GO TO 61
   44 CONTINUE
      IM = 0
      DO 55 I=1,NXT
      XI = DISTX(I)*DECAY
      DO 50 IM=1,NM
      IM = IM + 1
      RDCAY(IM)=XI
   50 IF(.NOT..MULTI) RDCAY(IM)=EXP(RDCAY(IM)/UMA(IM))                   JUNE'79
      IF(MULTI) GO TO 58                                                 JUNE'79
      IF (RDCAY(IM-NM+1).LT.1.E-8) GO TO 60                              JUNE'79
   55 CONTINUE
      GO TO 61
   60 NXT = I
   61 CONTINUE
      ZO = 0.
      ISTAB = 0
      IRWR = 0
      GO TO (52,54),ISIGZ
   52 CALL SIGZ1
      GO TO 40
   54 CALL SIGZ2
   40 IF(IRWR.EQ.0) GO TO 66
      RETURN                                                             JUNE'79
C
   66 CONTINUE
      ISTAB = 1
C GET SIGMAZ PARAMETERS
      DO 150 I=1,NXT
      XX = DISTX(I)
      GO TO (122,124),ISIGZ
  122 CALL SIGZ1
      GO TO 128
  124 CALL SIGZ2
  128 SSIGZ(I) = SIGZ
      IF (SIGZ.GT.ZIGMAX) GO TO 140
  150 CONTINUE
      RETURN
  140 CONTINUE
      DO 160 J=I,NXT
  160 SSIGZ(J) = ZIGMAX
      RETURN
      END

      SUBROUTINE CONCR(NSRA)
C ROUTINE TO COMPUTE CONCENTRATION AT RECEPTOR XR,YR,ZR FROM AREA SOURCE  JUNE'79
C GIVEN BY ARRAY Q WITH DIMENSIONS UX,UY,NM,
C THE COMPUTATION IS MADE BY INTEGRATING THE EFFECTS FROM EACH HOT, AND
C SUMMING.
C
      DIMENSION QX(15),QY(15),QH(5),TERM(5),QHZ(15),NMOINT(3,5)
C
      DIMENSION DISTX(200),RDCAY(400),SSIGZ(200),EXPOZ(400),            AREAS
     1UMA(5),UMA5(5),QI(2000),QI(800),QII(800)                          JUNE'79
C
      COMMON/AREAS/NXT,NE,DISTX,RDCAY,SSIGZ,EXPOZ,NH,NA,UMA,Q,QI,QII,CONC
C
      LOGICAL LDCAY
      COMMON/BASIC/IPRTN,ISTAB,IRWR,ISIGZ,NELIM,NXZLM,NLI,ROME           JUNE'79
     1,UMAX,ZIMAX,DECAY,INDEX,THETA,SIGMA,SIGY,SIGZ,XR,YR,ZR,XB,YB,XX,YY BASIC
     2,ISO,DLTA,XMRI,YMRI,GXI,GYI,DLTAI,NMI,XMNM,YMNM,GXM,GYM,DLTAM,NXM  BASIC
     3,XMNT,YMNT,GXT,GYT,DLTAT,NXT,ETTP,ICARD,NXI,NXU,NA,NNM,NNRS,NM     BASIC
     4,ISTAT,NRPRNT,NRREC,IRUF,NGROPT,NGHTAB,LDCAY                      JUNE'79
C
      COMMON/GRID/XMXI,YMXI,XMXM,YMXM,XMXT,YMXT,XICOR,YICOR,XMCOR,YMCOR
     1,XTCOR,YTCOR,COSA,SINA
C                                                                        GRID
C CONST = 1/(2*SQRT(2*PI))
      DATA CONST / 0.1994711 /
C
      LOGICAL MULTI
      COMMON /PTS/ PX(10),PY(10),HT(10),NSTA,MULTI                       JUNE'79
      REAL XR,YR,XL,YL                                                   JUNE'79
      REAL UMAP(5),UMAPS(5)                                              JUNE'79
      LOGICAL SECOND                                                     JUNE'79
      SECOND=.FALSE.                                                     JUNE'79
      NCDH=NH*(NSRA-1)                                                   JUNE'79
      DO 10 IM=1,NM                                                      JUNE'79
      QX(IM)=0.
      TERM(IM)=0.
      QH(IM)=2.*DLTA*EXPOZ(NCDH+IM)
   10 CONTINUE                                                           JUNE'79
C
      XHLF=0.
      XL=XR                                                              JUNE'79
      YL=YR                                                              JUNE'79
      DO 210 I=1,NXT                                                     JUNE'79
      XX = DISTX(I)                                                      JUNE'79
      XFL=XX*XX
C                                                                        JUNE'79
      DO 20 IM=1,NM
   20 QY(IM) = 0.
C CONVERT WIND ORIENTED COORDINATES TO GRID ORIENTED COORDINATES
      IF(.NOT.MULTI) GO TO 40
      XL=XR                                                              JUNE'79
      YL=YR                                                              JUNE'79
      CALL WFIELD(XLW,YLW,THETA,U)                                       JUNE'79
      DO 25 IT=1,NMAX                                                    JUNE'79
      ALPH=1.570796-THETA*0.01745329                                     JUNE'79
                                                                         JUNE'79
```

```
      COS=COS(ALPH)                                                      JUNE'75
      SIN=SIN(ALPH)                                                      JUNE'75
      XS=XL+DFL*COSA                                                     JUNE'75
      YS=YL+DFL*SINA                                                     JUNE'75
   25 CALL HFIELD(Z,S*(XL+XS),,S*(YL+YS),THETA,J)                         JUNE'75
      ALPHA=1.5707964-THETA*0.01745329                                   JUNE'75
      COS=COS(ALPH)                                                      JUNE'75
      SIN=SIN(ALPH)                                                      JUNE'75
   40 XL=XL+DFL*COSA                                                     JUNE'75
      YL=YL+DFL*SINA                                                     JUNE'75
      XS=XL                                                              JUNE'75
      YS=YL                                                              JUNE'75
C
      CALL WCHEK
      GO TO (50,51,52,210), IND                                          JUNE'75
C
   50 CONTINUE
      CALL RATE(QXI,QYI,DLTAI,QI,XS,YS,NHI,QXY,SAVEQ,NPOINT,NAI)
      NHIGH = NHI
      GO TO 54
   51 CONTINUE
      CALL RATE(QXM,QYM,DLTAM,Q,XS,YS,NHM,QXY,SAVEQ,NPOINT,NAI
      NHIGH = NHM
      GO TO 54
   52 CONTINUE
      CALL RATE(QXD,QYD,DLTAD,QD,XS,YS,NHD,QXY,SAVEQ,NPOINT,NAD)
      NHIGH = NHD
   54 CONTINUE
C
      IF(.NOT.MULTI) GO TO 60                                            JUNE'75
      DO 55 IH=1,NH                                                      JUNE'75
   55 UHAP(IH)=UHA(IH)                                                   JUNE'75
   60 IF(I.GT.1) GO TO 80                                                JUNE'75
C
      DO 70   IH = 1,NH
      ZVAL = EXP(Z(IH))
      IF(DCAY) ZVAL=ZVAL*EXP(-DCAY(IH)/UHAP(IH))                         JUNE'75
      TERMA(IH) = QXY(IH)*ZVAL
   70 CONTINUE
      GO TO 210                                                          JUNE'75
C
   80 CONTINUE
      IF(I.LE.NAI) GO TO 118
      IF(.NOT.MULTI.OR.SECOND) GO TO 90                                  JUNE'75
      SECOND=.TRUE.                                                      JUNE'75
      DO 85 IH=1,NH                                                      JUNE'75
   85 UHAPS(IH)=UHAP(IH)                                                 JUNE'75
   90 DO 115 IH=1,NH                                                     JUNE'75
      ZVAL = EXP(IH)                                                     JUNE'75
      IF(DCAY) ZVAL=ZVAL*EXP(-DCAY(NCUL+IH)/UHAP(IH))                    JUNE'75
      TERM=ZVAL*QXY(IH)                                                  JUNE'75
      IF(MULTI) TERM=TERM/UHAP(IH)                                       JUNE'75
      SXI(IH)=SXI(IH)+TERM                                               JUNE'75
  115 CONTINUE
C


      GO TO 210                                                          JUNE'75
C
  118 CONTINUE
      DO 150   IH = 1,NH
      K = (I-1) * NH + IH
      ZVAL = EXP(Z(K))
      IF(DCAY) ZVAL=ZVAL*EXP(-DCAY(K)/UHAP(IH))                          JUNE'75
      TERMB = QXY(IH)*ZVAL
      TERM=(TERMA(IH)+TERMB)*DFLX                                        JUNE'75
      IF(MULTI) TERM=TERM/UHAP(IH)                                       JUNE'75
      SXI(IH)=SXI(IH)+TERM                                               JUNE'75
      TERMA(IH) = TERMB
  150 CONTINUE
C
  210 XL=XS                                                              JUNE'75
C
C     END OF THE I = 1,NXI SOURCE POINT LOOP STARTING AT 010 + 2.
C
      IF(SECOND) GO TO 230                                               JUNE'75
      DO 220 IH=1,NH                                                     JUNE'75
  220 UHAPS(IH)=UHAP(IH)                                                 JUNE'75
  230 DO 275 IH=1,NH                                                     JUNE'75
      TERM=TERMA(IH)*DLTA                                                JUNE'75
      IF(MULTI) TERM=TERM/UHAPS(IH)                                      JUNE'75
      SXI(IH)=SXI(IH)+TERM                                               JUNE'75
  275 CONTINUE
C
      CONC=0.
      DO 250   IH = 1,NH
      IF(MULTI) GO TO 245
      CONC = CONC + SXI(IH) / UHA(IH)                                    JUNE'75
      GO TO 250
  245 CONC=CONC+SXI(IH)                                                  JUNE'75
  250 CONTINUE                                                           JUNE'75
      CONC = CONST * CONC
      RETURN
      END
```

```
      SUBROUTINE RF(X,Y,Z,IER)                                          JUNE'79
C SCIPL, STANDARD LIBRARY
C
      IMPLICIT REAL*8(A-H,O-Z)                                          A0E48
     1,INTEGER*4(I-N)                                                   A0E49
      PARAMETER (ERRTOL=.08D0,TINY=1.5D-38,BIG=3.D37,THIRD=1.D0/3.D0,   A0E50
     1C1=.4D0,C2=1.D0/7.D0,C3=.3D0,C4=1.5D0)                            A0E51
C
      IF(MIN(X,Y,Z).LT.0.D0.OR.MIN(X+Y,X+Z,Y+Z).LT.TINY.OR.MAX(X,Y,Z)  04B1C
     1.GT.BIG) PAUSE 'INVALID ARGUMENTS IN RF'                          04B2C
      XT=X                                                              04B3C
      YT=Y                                                              04B4C
      ZT=Z                                                              04B5C
      DO 10 ITER=1,NMAX                                                 04B6C
        SQRTX=SQRT(XT)                                                  04B7C
        SQRTY=SQRT(YT)                                                  04B8C
        SQRTZ=SQRT(ZT)                                                  04B9C
        ALAMDA=SQRTX*(SQRTY+SQRTZ)+SQRTY*SQRTZ                          04BAC
        XT=.25D0*(XT+ALAMDA)                                            04BBC
        YT=.25D0*(YT+ALAMDA)                                            04BCC
        ZT=.25D0*(ZT+ALAMDA)                                            04BDC
        AVE=THIRD*(XT+YT+ZT)                                            04BEC
        DELX=(AVE-XT)/AVE                                               04BFC
        DELY=(AVE-YT)/AVE                                               04C0C
        DELZ=(AVE-ZT)/AVE                                               04C1C
        IF(MAX(ABS(DELX),ABS(DELY),ABS(DELZ)).LT.ERRTOL) GO TO 20       04C2C
   10 CONTINUE                                                          04C3C
      PAUSE 'TOO MANY ITERATIONS IN RF'                                 04C4C
   20 E2=DELX*DELY-DELZ**2                                              04C5C
      E3=DELX*DELY*DELZ                                                 04C6C
      RF=(1.D0+(C1*E2-C2-C3*E3)*E2+C4*E3)/SQRT(AVE)                     04C7C
      RETURN                                                            04C8C
      END                                                               04C9C
C
      SUBROUTINE RD(X,Y,Z,IER)                                          JUNE'79
      IMPLICIT REAL*8(A-H,O-Z)                                          JUNE'79
      DIMENSION XX(NMAX),YY(NMAX),ZZ(NMAX)                              JUNE'79
      PARAMETER (ERRTOL=.05D0,TINY=1.D-25,BIG=4.5D21,C1=3.D0/14.D0,     P.IN79
     1C2=1.D0/6.D0,C3=9.D0/22.D0,C4=3.D0/26.D0,C5=.25D0*C3,            P.IN79
     2C6=1.5D0*C4)                                                      P.IN79
      IF(MIN(X,Y).LT.0.D0.OR.MIN(X+Y,Z).LT.TINY.OR.MAX(X,Y,Z).GT.BIG)   P.IN79
     1PAUSE 'INVALID ARGUMENTS IN RD'                                   P.IN79
      XT=X                                                              P.IN79
      YT=Y                                                              P.IN79
      ZT=Z                                                              P.IN79
      SUM=0.D0                                                          P.IN79
      FACT=1.D0                                                         P.IN79
      DO 10 ITER=1,NMAX                                                 P.IN79
        SQRTX=SQRT(XT)                                                  P.IN79
        SQRTY=SQRT(YT)                                                  P.IN79
        SQRTZ=SQRT(ZT)                                                  P.IN79
        ALAMDA=SQRTX*(SQRTY+SQRTZ)+SQRTY*SQRTZ                          P.IN79
        SUM=SUM+FACT/(SQRTZ*(ZT+ALAMDA))                                P.IN79
        FACT=.25D0*FACT                                                 P.IN79
        XT=.25D0*(XT+ALAMDA)                                            P.IN79
        YT=.25D0*(YT+ALAMDA)                                            P.IN79
        ZT=.25D0*(ZT+ALAMDA)                                            P.IN79
        AVE=.2D0*(XT+YT+3.D0*ZT)                                        P.IN79
        DELX=(AVE-XT)/AVE                                               P.IN79
        DELY=(AVE-YT)/AVE                                               P.IN79
        DELZ=(AVE-ZT)/AVE                                               P.IN79
        IF(MAX(ABS(DELX),ABS(DELY),ABS(DELZ)).LT.ERRTOL) GO TO 20       P.IN79
   10 CONTINUE                                                          P.IN79
      PAUSE 'TOO MANY ITERATIONS IN RD'                                 P.IN79
   20 EA=DELX*DELY                                                      P.IN79
      EB=DELZ**2                                                        P.IN79
      EC=EA-EB                                                          P.IN79
      ED=EA-6.D0*EB                                                     P.IN79
      EE=ED+EC+EC                                                       P.IN79
      RD=3.D0*SUM+FACT*(1.D0+ED*(-C1+C5*ED-C6*DELZ*EE)                  P.IN79
     1+DELZ*(C2*EE+DELZ*(-C3*EC+DELZ*C4*EA)))/(AVE*SQRT(AVE))           P.IN79
      RETURN                                                            P.IN79
      END                                                               P.IN79
C
C ROUTINE STARTS INTERACTIVE INPUT OF INPUT AND OUTPUT ARRAYS,
C     SETS TO A DAT
C AND CHECKS THAT INPUT IS IN RANGE 0 AND ALLOW ARRAYS
C     SET TO A DAT
C AND  STARTS INTERACTIVE INPUT OF XIN, YIN, ZIN, INDT AND INPIN ARRAYS,
C     SET TO ZERO
C
      XIN=0.
      YIN=0.
      ZIN=0.
      INDT=0.
      INPIN=0.
      XOUT=0.
      YOUT=0.
      ZOUT=0.
      INDT=0.
      INPOUT=0.
C
C SET INPUT ARRAYS
C
      DO 10 I=1,NPTS
      XIN(I)=0.
      YIN(I)=0.
      ZIN(I)=0.
      INDT(I)=0
      INPIN(I)=0
   10 CONTINUE
C SET DATA FOR THE TYPE OF STATE WANTED
      XFAC=0.
      ATM=0.
      RAT=0.
      TEMP=0.
      CALL INPUT
      IF(IER.EQ.1) GO TO 30                                             JUNE'79
      WRITE(ITERM,1001) (I,XIN(I),YIN(I),ZIN(I),INDT(I),INPIN(I),I=1,NPTS)
 1001 FORMAT(' DATA NOT PLACED',4F8.0)
      GO TO 10
C
C SET DATA FOR THE OUTPUT STATE WANTED
   30 CALL INPUT                                                        JUNE'79
C CHECK IF INPUT IS WITHIN DATA, SWITCH TO NEXT DATA SET IF WITH
C SWITCH LIMIT, WRITE IF WITH INTERPOLATION LIMITS
C WRITE TO ITERM
C
      IF(XFAC.EQ.1.D0) GO TO 150                                        JUNE'79
      IF(ATM.LT.1.D-6.OR.ATM.GT.7.8539982) GO TO 150                    JUNE'79
C
C SET CON AND MIN FACTORS FOR WIND/SPEED CONVERSIONS
      A=0.
      CON=1.
      DO 40 I=1,NPTS
      XIN(I)=0.
   40 YIN(I)=0.
C
C GET AREA SQUARE WIND SPEED AND FACE PRESSURE
      DO 50 I=1,NPTS
      XIN(I)=1.
      IF(XIN(I).GT.10.) XIN(I)=10.*(XIN(I)/10.)**.166667
      IF(.NOT.YIN(I)) XIN(I)=10.*XIN(I)**.5
      CALL PL(XIN(I),Z)
      CALL ATM(Z)
      IF(IERR.EQ.0) GO TO 60                                            JUNE'79
      WRITE (ITERM,1001) IERR,A=ON,DAY,=LOG
 1001 FORMAT (' ERROR, GO TO WHAT DATA SET',4F8.0)
      GO TO 160
   60 CONTINUE
C
C GET CONCENTRATION FOR EACH RECEPTOR LOCATION
      ZB=0.
      DO 140 I=1,NRECP
      XRECP=0.
      XRECP(I)
      YRECP(I)
      ZB=Z
      ZB=ZRH(I)
      IF(ZH.EQ.ZB) GO TO 80                                             JUNE'79
```

```
      CALL EXPZH
   40 CONTINUE
      CALL RESET
      CALL CONTIN(KMAX)
      IF(KMAX.EQ.0) GO TO 100                                           JUNE'75
      WRITE (IPRNTR,1001) KMAX,AMON,DAY,HOUR                            JUNE'75
      GO TO 160
  100 CONTINUE
      CAMPA    = CONC * PTTP
      CMPIN(I) = CONMP
      CNST(I) = CAMPA * CMPIN(I) * BACKGR
  110 CONTINUE
      NRCNTR = NRCNTR + 1.
      CALL OUTPT
      GO TO 160
  150 CONTINUE
      WRITE(IPRNTR,1005) NPOL,THTA
 1005 FORMAT (' ',IND INPUT IS UNACCEPTABLE,NPOL=',F6.1
     1,'  THTA =',F7.2)
C
  160 CONTINUE
      CALL          INCRT
      IF(STOP.NE.1) GO TO 20
C                                                                       JUNE'75
      CALL STAB_W(NRCNTR)
      CALL EXIT
      END


      SUBROUTINE BASIC
C *CALCULATE THE COMPLETE VERTICAL DIFFUSION FACTOR INCLUDING EFFECTS OF
C   DECAY AND COMBINED DEPOSITION FROM EACH TO BE SOURCE HEIGHTS.
C
C BASIC EQUATION IS
C         CHPOF * ( EXP(AY / SIGZ )+EXP(-H,SX((HA+ZR)/SIGZ)**2) +
C                                   EXP(-H,SX((HA+ZR)/SIGZ)**2))
C
      DIMENSION CONTA(200),EXPAY( 4),Y,YSIGZ(200),EXPHZ( 4),
     1,HA(5),,HA(5),,(200),,Z(200),,SZ(200),,DC(17,19),,BLM(10,19)
     2,D(4),FACP  (DIMENSION(1),DC(1,1),,(B,M(1,1),,DC(1,1)
C
      COMMON/AREAS/XS1,XS,CONTA,EXPAY,YSIGZ,EXPHZ,XM,HA,,HA,2,01,DD,CONC
C
      COMMON/BASIC/IBOTH,IBTAD,IBAD,IBIAD,XS,IM,XSZ,,,,,BONE
     1,XMAX,CONS,DECAY,IXDB,THTA,CIGMA,SIGY,SIGZ,XX,XW,ZR,XB,YY,BB,YA
     2,FN,,,,TA,XMAI,YMAI,SBI,BYI,DLTAI,XWI,XXXW,YWWW,SBW,BYW,DLTAW,XWW
     3,XWAI,YWAI,SBAI,BYAI,DLTAI,XWD,BYYW,(CAPD,XBI,,XA,,XA,XWW,XXBB,XW
     4,ISTAT,XPIRST,,YWWIP,IXIB,XDBUT,,XWTWW
C                                                                       BASIC
C                                                                       BASIC
      LOGICAL PRINT
      COMMON/DEBUG/PRINT(10),,HTSTK,XBTA,,(1)
C INPUT                                                                 JUNE'75
C                                                                       JUNE'75
C             ZR = RECEPTOR HEIGHT
C             HA = NUMBER OF SOURCE HEIGHTS
C             HA = ARRAY OF SOURCE HEIGHTS
C          CONC = MIXING CRITERIA
C          BACKG = CONSTANT DIFFUSION PARAMETERS
C
C OUTPUT
C          FACP = VERTICAL DIFFUSION FACTOR
      K = 0
      DO 80 IBI,XBI
      DO 50 IBI,XM
      F = (HA(I) - ZR) /SSIGZ(   J)
      IF(F.LE.50.) GO TO 12                                             JUNE'75
      F1 = 0
   11 CONTINUE
      EZ = 0
      GO TO 15
   12 CONTINUE
      F1 = EXP(-0.5 * F * F)
      F = (HA(I) + ZR) /SSIGZ(   J)
      IF(F.GT.7.) GO TO 11
      F2 = EXP(-0.5 * F * F)                                            JUNE'75
   15 CONTINUE
      K = K + 1
      EXPHZ(K)=(F1+F2)/SSIGZ(J)
      IF(.NOT.PRINT) EXPHZ(K)=F*EXPHZ(K)*EXPCAY(K)                      JUNE'75
   50 CONTINUE                                                          JUNE'75
      IF(K.LE.XM) GO TO 60
      IF(DIST(J).LT.DIST(J-1)+DLTA) GO TO 60                            JUNE'75
      DO 54 I=1,XM                                                      JUNE'75
      IF(EXPHZ(K-I+1).LE.0.9999*EXPHZ(K-I+1-XM)) GO TO 60               JUNE'75


   54 CONTINUE
      XX = J
      RETURN
   60 CONTINUE
      XX = XXI
      RETURN
      END
```

```
      SUBROUTINE POINT
C
C      DUE TO EMISSIONS FROM SPECIFIED  POINT SOURCES
C
C BASIC EQUATION IS
C          CONPT =(Q/(2*PI*U*SIGY*SIGZ))*EXP(-0.5*(Y/SIGY)**2-DECAY*X/U)
C                 *(EXP(-0.5*((Z-H)/SIGZ)**2)+EXP(-0.5*((Z+H)/SIGZ)**2))
C
C              U = USPD*(ZP/ANHGT)**PWIND
C          SIGY = HORIZONTAL DIFFUSION PARAMETER
C          SIGZ = VERTICAL DIFFUSION PARAMETER
C             X = DOWNWIND DISTANCE BETWEEN SOURCE AND RECEPTOR
C             Z = ZR
C             H = ZP
C
      DIMENSION A(5,4), B(5,4)
      DIMENSION DISTX(200),STOAT(400),SSIGZ(200),FAPUZ( 400)              AREAS
     1,WA(5),UWA(5),D(2000),DI(400),QU(1000),DE(17,15)),SUM(6,15))        AREAS
      EQUIVALENCE (DISTX(1),D(1,1)),(SUM(1,1),D(1))                       AREAS
C
      COMMON/AREAS/WI,WX,DISTX,SDCAY,SSIGZ,FAPUZ,WW,WA,UWA,Q,DI,QU,CONC
C
C
      COMMON/BASIC/IPATH,ISTAB,IRR,ISIGD,NXLIM,NAZLM,NLI,RUNE
     1,ANAA,CONA,DECAY,INDEX,THTA,CIGMA,SIGY,SIGZ,XR,YR,ZR,XS,YS,XW,YW    BASIC
     2,IND,DLTA,XMNI,YMNI,GXI,GYI,DLTAI,NXI,XMXX,YMXX,GXM,GYM,DLTAM,NXM   BASIC
     3,XMNO,YMNO,GXO,GYO,DLTAO,NXO,ATTR,ICASE,NAI,NAO,NA,NXM,NNPS,NR      BASIC
     4,IRIRT,NPIRST,NHRSTR,IHR,NUMCDT,NUMTHD                              BASIC
C
      COMMON/GRID/XMXI,YMXI,XMXM,YMXM,XMXO,YMXO,XICOR,YICOR,XMCOR,YMCOR
     1,XOCOR,YOCOR,COSA,SINA                                              GRID
C
      DIMENSION XP(400),YP(400),ZP(400),HP(400),ZP(400),DP(400),VP(400)   POINTS
     1,TP(400),STOWS(5),XPPS,XL(400),CONPT(400),CNCA(1500),HPEPA(400)     POINTS
      INTEGER*2 NSTC(400),IP(400)                                         POINTS
      EQUIVALENCE (IPA(1),XP(1))                                          POINTS
C
      COMMON/PNTS/XPS,XP,YP,ZP,HP,DP,TP,VP,TP,NPSS,CONPS,INCHG,SSIGY      POINTS
     1,NSIG,ALDD,CONPT,IPJ,HPEPA                                          POINTS
C
      COMMON/WNDSP/USPD,ANHGT,PWIND
C
      LOGICAL MULTI                                                       JUNE'75
      COMMON /MTN/ POINT,PTIMI,HT(3),NSTA,MULTI                           JUNE'75
C INPUTS
C         XR,YR,ZR = RECEPTOR LOCATION IN SOURCE GRID COORDINATES
C               NPS = NUMBER OF POINT SOURCES
C         XP,YP,ZP = ARRAYS OF POINT SOURCE LOCATIONS IN SOURCE GRIDS
C                QP = POINT SOURCE EMISSION RATE
C              RUNE = CLOSEST DISTANCE TO RECEPTOR
C             ISIGD = DISPERSION PARAMETER OPTION
C             DECAY = DECAY CONSTANT
C              THTA = WIND DIRECTION
C              USPD = WIND SPEED AT HEIGHT ANHGT
C             PWIND = WIND PROFILE PARAMETER


C             INDEX = DIFFUSION STABILITY PARAMETER
C             CIGMA = MIXING CEILING
C
C OUTPUTS
C              CONPT = CONCENTRATION FROM SIGHT POINT
C              CONPS = CONCENTRATION AT RECEPTOR FROM NPS POINT SOURCES
C
      DATA ISTAT / 0,0,0,0,0 /
      DATA A/1,10.7, [illegible],11,1.494,   .1654,.2751,.2089,.1474,.1046/
      DATA B/ 0,0,[illegible],750,0,710,0,650,0,0,911/
C
      IF (ISTAT(INDEX).EQ.1) GO TO 7
      ISTAT = 1
      J = 0
      DO 20 DATA=NG,1,K1
      XW = DISTX(I)
      J = J + 1
      DO 200 IN =1,5
      SSIGY(IN,J) = A(IN,ISIGD)*XW**B(IN,ISIGD)
  200 CONTINUE
   20 CONTINUE
    7 CONPS = 0
      DO  50 I = 1,NPS
      CONPT(I) = 0.
      IF (QP(I).LE.0.) GO TO 50
      HH = ZP (I)
C CONVERT SOURCE ORIENTED COORDINATES TO WIND ORIENTED COORDINATES
      IF(.NOT.MULTI) GO TO 5                                              JUNE'75
      CALL WFIPLT,5*(XR+XP(I)),.5*(YR+YP(I)),THETA,WSPD)                  JUNE'75
      ALPHA=1.5707963-THETA*0.01745329                                    JUNE'75
      COSA=COS(ALPHA)                                                     JUNE'75
      SINA=SIN(ALPHA)                                                     JUNE'75
    5 XW= (XP(I) - XR)*COSA + (YP(I) - YR)*SINA                           JUNE'75
      YW = (YP(I) - YR)*COSA - (XP(I) - XR)*SINA
C
      IF(XW -RUNE) 10,10,10
   10 CONTINUE
      IF (HP(I) + 0.5*(HH - HP(I)) - CIGMA) 22,40,40
   22 CONTINUE
      IF (HH - 1.) 28,29,29
   28 CONTINUE
      HH = 1.
   29 CONTINUE
      IF (XW.LT.DISTX(INCHG)) GO TO 30
      J = (XW - DISTX(INCHG))/DLTA + 1
      IF (J.GT.NXI) GO TO 30
      SIGY = SSIGY(INDEX,J) + ((XW - DISTX(J))/DLTA)*(SSIGY(INDEX,J+1)
     1  -SSIGY(INDEX,J))
      GO TO 31
   30 J = 0
      SIGY = A(INDEX,ISIGD)*XW**B(INDEX,ISIGD)
   31 CONTINUE
      FY = YW/SIGY
      FY2 = FY * FY
      IF (FY2 -36.) 32,40,40
```

```
      SUBROUTINE GRID
C DEFINES GRID TO POINT AB,YB IN ultmin IMAGE GRID (I=1,M), ultmin OUTPU
C GRID (I=M+1) OR OUTSIDE OUTPU GRID (I=2M)
C CONNECT AB,YB TO APPROPRIATE GRID COORDINATES
C
      COMMON/BASIC/IBATA,IBTAA,IEBB,IBIGD,BBLIB,BBILB,BUBF
     1,BBAB,CONB,DECAB,IWDEB,BWTA,CIGBB,BIGB,BIGZ,BB,BB,BB,BB,BB,BB      BASIC
     2,IWD,BLTB,BBWI,BBWI,BBI,BBI,BLTAI,BWI,BBBB,BBBB,GBB,BBB,BLTAB,BBB  BASIC
     3,BBBB,BBB,GBI,GBB,BLTAB,BBBB,BTTB,IC44D,WBI,WBC,WB,BBB,BBBB,WB     BASIC
     4,IBTWI,WPIWBT,WWBECB,IWTB,WGBDDT,WBBTWB                            BASIC
C
      COMMON/GRID/BWBI,BWBI,BBIB,BBBB,BBBJ,BBBD,BIDDB,BIDDB,BBDDB,BBDDB
     1,BIDDB,BDDDB,DDBB,BIBB
C                                                                        GRID
      IF (IDIAGG) P,1,2
    1 CONTINUE
C
      BWBI = BBBI + BBIBLTAI
      BBBI = BBBI + BBIBLTAI
      BBBB = BBBB + BBBBLTAB
      BBBB = BBBB + BBBBLTAB
      BBBB = BBBB + BBBBLTAB
      BBBB = BBBB + BBBBLTAB
      BIDDB = B.BBBLTAIB BBBI
      BIDDB = B.BBBLTAIB BBBI
      BBDDB = B.BBBLTAB + BBBB
      BBDDB = B.BBBLTAB + BBBB
      BIDDB = B.BBBLTAB + BBBB
      BIDDB = B.BBBLTAB + BBBB
      BBLB
      IF (BBI-BB
    2 CONTINUE
      IF (BBI = BBBI) 10,50,50
   10 CONTINUE
      IF (BB = BBBI) 20,50,50
   20 CONTINUE
      IF (BBJ = BBBI)100,50,30
   30 CONTINUE
      IF (BB = BBBI) 50,50,40
   40 CONTINUE
      BB B BB + BIDDB
      BB B BB + BIDDB
      IWD B 1
      BBI=BB
   50 CONTINUE
      IF (BB = BBBI) 60,170,170
   60 CONTINUE
      IF (BB = BBBI) 70,170,170
   70 CONTINUE
      IF (BB = BBBI) 100,100,80
   80 CONTINUE
      IF (BB = BBBI) 100,100,90
   90 CONTINUE
      BB B BB + BBDDB
      BB B BB + BBDDB
      IWD B 2


      BBI=BB
  100 CONTINUE
      IF (BB = BBBI) 110,150,150
  110 IF (BB = BBBI) 120,150,150
  120 IF (BB = BBBI) 130,150,130
  130 IF (BB = BBBI) 150,150,140
  140 CONTINUE
      BB B BB + BIDDB
      BB B BB + BBDDB
      IWD B 3
      BBI=BB
  150 CONTINUE
      IWD B 4
      BBI=BB
      END
```

```
      SUBROUTINE GETP(IX,IY,DLTA,Z,ZB,ZS,NN1,GRX,GRYG,NPOINT,N BB)
C
C A SUBROUTINE TO INTERPOLATE EMISSION RATE OF A POINT INTERMEDIATE TO
C POINTS ON A STANDARD GRID SYSTEM
C
      DIMENSION Z(N,NBB), GRY(5), SAVEZ(3),   NPOINT(3,5)
C
      DO 1000  I = 1,5
      SAVEZ(I) = 0.
1000  CONTINUE
C
C INITIALIZE INTEGER CONSTANTS
      IGRD = 2X
      JGRD = 2Y
      NS = IGRD + JGRD
      X = X3/ DLTA
      IX = X
      Y = Y3/ DLTA
      IY = Y
C CHECK TO POINT IS ON DLTA3ZE POINGE OR GRID, I,E, WITHIN 0,5 GRIDS OF
C EDGE.  IF POINT IS IN POINGE CONNERS, USE CORNER GRID VALUES,  OTHER
C POINTS, LINEARLY INTERPOLATE BETWEEN EDGE GRID POINTS,
      IF (X = IGRD) 10,1,1
    1 CONTINUE
      IF (Y = JGRD) 5,2,2
    2 CONTINUE
      I = 0
    3 CONTINUE
C
C USE CORNER VALUE,
      SAVEZ(1) = 1,
      DO 4 I=1,NN1
      I = I + NS
      GRY(I) = Z(I)
      NPOINT(1,I) = I
    4 CONTINUE
      RETURN
C
    5 CONTINUE
      IF (IY) 6,6,7
    6 CONTINUE
      I = IGRD + NS
      GO TO 3
    7 CONTINUE
      I1 = IX + IGRD - NS
      I2 = I1 + JGRD
      DX = X - IX
    8 CONTINUE
C
C USE LINEAR INTERPOLATION ON EDGE
      SAVEZ(1)   = 1, - DX
      SAVEZ(2)   = DX
      DO 9 I=1,NN1
      I1 = I1 + NS
      I2 = I2 + NS



      GRY(I) = Z(I1) + DX * (Z(I2) - Z(I1))
      NPOINT(1,I) = I1
      NPOINT(2,I) = I2
    9 CONTINUE
      RETURN
C
   10 CONTINUE
      IF (IX) 11,11,12
   11 CONTINUE
      IF (IY - JGRD) 13,12,12
   12 CONTINUE
      I = IGRD
      GO TO 3
   13 CONTINUE
      IF (IY) 14,14,15
   14 CONTINUE
      I = NS
      GO TO 3
   15 CONTINUE
      I2 = IX + IGRD + 1 - NS
      I1 = I2 - JGRD
      DX = X - IX
      GO TO 8
   16 CONTINUE
      IF (X -JGRD) 18,17,17
   17 CONTINUE
      I1 = IX + IGRD
      I2 = I1 + 1
      DX = X - IX
      GO TO 8
   18 CONTINUE
      IF (IY) 19,19,20
   19 CONTINUE
      I1 = IX - NS
      I2 = I1 + 1
      DX = X - IX
      GO TO 8
   20 CONTINUE
      I1 = IX + (IY - 1) * IGRD - NS
C
C DETERMINE WHICH TRIANGLE OF GRID POINTS WILL BE USED FOR INTERPOLATION
      BX = X - IX
      BY = Y - IY
      IF (BX - BY) 200,100,100
C
  100 CONTINUE
      SAVEQ(1)   = 1, - BX
      SAVEQ(2)   = BX - BY
      SAVEQ(3)   = BY
      DO 150 I=1,NN1
      I1 = I1 + NS
      I2 = I1+ 1
      I3 = I2 + IGRD
      GRY(I)=Q(I1)   + BX * ( Q(I2      )-Q(I1   ))+BY*(Q(I3)- Q(I2))
      NPOINT(1,I) = I1
```

```
      WRITE(IP,1) W
      WRITE(IS,1) W
  150 CONTINUE
      RETURN
C
  200 CONTINUE
      SAVE(1)   = 1. - R
      SAVE(2)   = R**2 - RR
      SAVE(3)   = RR
      DO 300 I=1,NM1
      N1 = N1 + NC
      N2 = N1 + 1
      N3 = N1 + NCP1
      N4 = N3 + 1
      DAY(I)=Q(N1)   + RR * (Q(N2)      TWO(I)    (1+RR+(R(N4) + R(N3)))
      WRITE(IP,1) N1
      WRITE(IP,1) N2
      WRITE(IS,1) N3
  300 CONTINUE
      RETURN
      END



      SUBROUTINE FORECT(NDUM,IPRT,IFIN)
C
C CALCULATE PRESSURE FACTOR (ACTUAL TIME AND ALL MEAN PRESSURE DATE)
C FOR SPECIFIED DATE, TIME AND TEMPERATURE
C
      DIMENSION TTT(24),R1(24),R2(24)
C
      DATA TTT/50,55,55,55,56,58,59,61,63,66,11005,04,02,00/
C
      DATA R1/.0101,.0137,.0137,.0105,.0101,.0350,.1000,.0702
     1       ,.1005,.0977,.0430,.0011,.0011,.0010,.0018,.0033
     2       ,.1483,.1918,.1547,.0556,.0504,.0800,.0343,.0203/
C
      DATA R2/.0428,.0417,.0399,.0399,.0431,.0401,.0543,.0598
     1       ,.0528,.0496,.0421,.0399,.0385,.0343,.0348,.0341
     2       ,.0343,.0351,.0368,.0390,.0478,.0421,.0429,.0431/
C
C SPECIFY TEMPERATURE IN DEG AL FOR DESIRED MONTH AND DESIRED DAY BEGINNING
      DATA TEMP/-5,24/
C
      I = NDUM + 1
   91 ITEST=TEMP
      IF(TTT(I),EQ,ITEST) GO TO 92
      I = I + 1
      GO TO 91
   92 CONTINUE
      PRT = R1(I) + (R2(I) - R1(I)) * TEMP
      PRT = PRT * 29.92 + .0002557
      PRAC = PRT**2 * .5
      PRINT 6 (I, = TEMP,R) = R1(I) / 100,
     1 PRT = PRT, = PRAC = PRAC(I)
      RETURN
      END



      SUBROUTINE INCRT
C
C IF IS A NEW YEAR INCREMENT THE TIME AT CONCENTRATION AND CALC, BY THE
C TIME STEP DESIRED, IN ADDITION TO THIS IF SPECIFIED THE TIME INCR
C WILL BE SET TO ZERO AND THE SOURCE MATRIX AND METEOROLOGICAL INFO IS
C STORED FOR THAT TIME AT WHICH THE CONCENTRATION IS REQUIRED.
C
      DIMENSION DAYY(2),MDUM(2)                                    DAYINC
C
      COMMON/ATTAC/ IQUM,TTTT,TEMP,MM,DAYY,NDUM
C
      DIMENSION CPDIN(1301),CNCT(1301),WWW(1301),WWW(1301),ZZZ(1301)      DUMMY
C
      COMMON/DUMMY/IQ,TYPE48,AMDUM,DAY,MDUM,WWWCP,CNCT,CPDIN,WWW,WWW,ZZZ,IDUM
     1,IFWD,A,AT,B,,BX,BB,CIDW1,CIDW2,IBEGN,MACHGO,INDP,I,INE,BWDA       DUMMY
C
      DIMENSION DIM(12)
C DIM IS AN ARRAY REPRESENTING THE NUMBER OF DAYS IN EACH MONTH
C
      DATA DIM / 31,,28,,31,,30,,31,,30,,31,,31,,30,,31,,30,,31, /
      NDUM = 24,
C
C THE ARRAYS MDUM, AMDUM, DAYY, NDUM CONTAIN THE YEAR (TWO DIGITS),NO,
C DAY, AND HOUR OF THE FIRST AND LAST CALCULATION (INCREMENT AND INCREMENT
C RESPECTIVELY)
C
C CHECK FOR LEAP YEAR
      TEST= YEARR(1) / 4,
      ITEST=TEST
      IF(ITEST-TEST) 200,100,200
  100 CONTINUE
C YEAR(1) IS A LEAP YEAR
      DIM(2)=29,
      GO TO 220
  200 CONTINUE
      DIM(2) = 28,
  220 CONTINUE
C INCREMENT HOUR
      HOUR(1) = HOUR(1) + DH
C CHECK TO SEE IF HOUR(1) IS IN THE SAME DAY
  230 IF(HOUR(1)-NDUM(1)) 600,600,300
  300 CONTINUE
C HOUR(1) IS NOT IN THE SAME DAY
      HOUR(1) = HOUR(1) - 24,
C SET DAY OF WEEK INDEX
  290 IDUM = IDUM + 1
      IF (IDUM - 7) 270,270,260
  260 IDUM = 1
  270 CONTINUE
      DAYY(1) = DAYY(1) + 1,
C CHECK TO SEE IF DAY(1) IS IN THE SAME MONTH
      MONTH=AMDUM(1)
      IF (DAYY(1) - DIM(MONTH)) 250,250,400
  400 CONTINUE
C DAY(1) IS NOT IN THE SAME MONTH
      AMDUM(1) = AMDUM(1) + 1,
```

```
      SUBROUTINE PRATI
C
C PRINT BASIC INPUT VALUES UNCHANGED FOR RUN
C
      DIMENSION DISTX(280),XDCAY( 840),SSIGZ(280),EXPOZ( 840)          AREAS
     1,HA(5),UHA(5),Q(2000),QI(600),QQ(1000),DC(17,131),SUM(6,131)     AREAS
      EQUIVALENCE (DISTX(1),DC(1,1)),(SUM(1,1),QQ(1))                  AREAS
C
      COMMON/AREAS/NXI,NX,DISTX,XDCAY,SSIGZ,EXPOZ,NH,HA,UHA,Q,QI,QQ,CONC
C
      COMMON/BASIC/IPRTR,ISTAR,IERR,ISIGD,NXLIM,NZLM,NLI,XONE
     1,XMAX,CONX,DECAY,INDEX,THTA,CIGMX,SIGY,SIGZ,XR,YR,ZR,XS,YS,XM,YM  BASIC
     2,IND,DLTA,XMNI,YMNI,GXI,GYI,DLTAI,NMI,XMNM,YMNM,GXM,GYM,DLTAM,NMM BASIC
     3,XMNO,YMNO,GXO,GYO,DLTAO,NMO,FTTF,ICARD,NAI,NAO,NA,NMM,NMPB,NR    BASIC
     4,ISTRT,NFIRST,XMRECP,IWDF,NGRDOT,NGRTMP                           BASIC
C
      DIMENSION YEARR(2),AMONN(2),DAYY(2),HOURR(2)
C
      COMMON/DATIME /DM,STOP,YEARR,AMONN,DAYY,HOURR
C
      DIMENSION CPOIN(130),CNCT(130),XRR(130),YRR(130),ZRR(130)        OUTPUT
C
      COMMON/OUTPUT/YEAR,AMON,DAY,HOUR,NRECP,CNCT,CPOIN,XRR,YRR,ZRR,IDO=
     1,TEMP,ALAT,PU,PN,PS,CIGM1,CIGM2,TREGN,BACKGR,INDP,ILINE,PMODA    OUTPUT
C
      DIMENSION XP(680),YP(680),ZP(680),HP(680),QP(680),DP(680),VP(680)  POINTS
     1,TP(680),SSIGY(5,280),NLOC(680),CONPT(680),CNCA(13080),HPEP4(680) POINTS
      INTEGER2 NSTC(680),IPJ(680)                                      POINTS
      EQUIVALENCE (CNCA(1),XP(1))                                      POINTS
C
      COMMON/POINTS/NPS,XP,YP,ZP,HP,QP,DP,VP,TP,NPBS,CONPB,IXCHG,SSIGY
     1,NSTC,NLOC,CONPT,IPJ,HPEP4                                      POINTS
C
      COMMON/MODSP/MSPD,MMGT,PMIND
C
      REAL*8 DIFFU(2)/'URBAN','RURAL'/,POLLU(2)/'   SO2','PARTICLE'/
C
      WRITE(IPRTR,1000)   (YEARR(I),AMONN(I),DAYY(I),HOURR(I),I=1,2),DM
 1000 FORMAT(1H1////10X'PARAMETERS FOR THIS SCIM RUN'////31X'YEAR MONTH
     1  DAY  HOUR'/1HX'FIRST HOUR',1X4F6.0/19X'LAST HOUR',1X4F6.0//12X
     2'SAMPLE INCREMENT',F15.0,1X'HOURS')
C
      WRITE(IPRTR,1008) DECAY,DIFFU(ISIGD),ALAT,MMGT,CIGM1,CIGM2,BACKGR
     1,PU,PN,PS
 1008 FORMAT(14X'DECAY CONSTANT',E13.3,' PER SECOND'/11X'TYPE OF DIFFUSI
     1ON',A6,5/10X'LATITUDE OF REGION',F13.2,' DEG.'/7X'WIND MEASURING H
     2EIGHT',F13.1,' METERS'/3X'MEAN MORNING MIXING DEPTH',F13.0,' METER
     3S'/1X'MEAN AFTERNOON MIXING DEPTH',F13.0,' METERS'/6X'BACKGROUND C
     4ONCENTRATION',F13.0,' UG/CU.M'//31X'UNSTABLE NEUTRAL   STABLE'/7X
     5'WIND PROFILE EXPONENT',3F9.2)
C
      IPOL = INDP
C PRINT POINT SOURCE DATA
      I2 = 0
      IPS = (NPS - 1)/50 + 1



      DO 910 IP=1,IPS
      I1 = I2 + 1
      IF (NPS - I2 - 50) 901,901,902
  901 I2 = NPS
      GO TO 903
  902 I2 = I2 + 50
  903 CONTINUE
      WRITE(IPRTR,1006) IP,POLLU(IPOL),(I,XP(I),YP(I),HP(I),QP(I),DP(I)
     1,VP(I),TP(I),I=I1,I2)
 1006 FORMAT('1POINT SOURCE EMISSION DATA',57X'PAGE',I3//36X4H/2HX'STACK
     1',3X'EMISSION',  5X'STACK',6X'EXIT',9X'EXIT'/27X'HEIGHT',5X'RATE'
     2,      5X'DIAMETER',5X'VELOCITY',3X'TEMPERATURE'/' NUMBER',6X'X'
     3,8X'Y',8X'(M)'          ,5X'(G/SEC)',6X'(M)',6X'(M/SEC)',5X'(DEG.
     4K)'//(1X16,-3P2F9.1,0PF8.1,-6PF11.5,0PF11.1,F10.1))
  910 CONTINUE
C
C PRINT AREA SOURCE DATA
      II2 = GYI
      I2 = 0
      DO 920 IP=1,NMI
      WRITE(IPRTR,1004) HA(IP),POLLU(IPOL),XMNI,DLTAI
 1004 FORMAT('1AREA SOURCE EMISSION DATA'/1X'INNER GRID, HEIGHT=',F6.1,'
     1M,',A12,' EMISSION RATE IN UG/SQ.M/SEC'//8X'Y',5X'X1=',-3PF7.1,5X
     2,'DX=',F5.1/)
      DO 911 II=1,II2
      I1 = I2 + 1
      I2 = I2 + GXI
      JJ = (YMNI + (II - 1)*DLTAI)/1000.
      WRITE(IPRTR,1005) JJ,(QI(I),I=I1,I2)
 1005 FORMAT( 1X,I9,10F10.5/(10X10F10.5))
  911 CONTINUE
  920 CONTINUE
      I2 = 0
      ILY = (GYM - 1.)/10.
      ILY = ILY + 1
      DO 930 IM=1,NMM
      NYP = 50/ILY
      NP = (GYM - 1.)/NYP
      NP = NP + 1
      JJ =(YMNM - DLTAM)/1000.
      DO 930 IP=1,NP
      WRITE(IPRTR,1010) HA(IM),POLLU(IPOL),IP,XMNM,DLTAM
 1010 FORMAT('1AREA SOURCE EMISSION DATA'/1X'MIDDLE GRID, HEIGHT=',F6.1
     X,'M,',A12,' EMISSION '
     1'RATE IN UG/SQ.M/SEC',54X'PAGE',I3//8X'Y',5X'X1=',-3PF7.1,5X'DX='
     2,F5.1/)
      IF (IP - NP) 922,921,921
  921 NYP = GYM - (NP - 1)*NYP
  922 CONTINUE
      DO 923 II=1,NYP
      I1 = I2 + 1
      I2 = I2 + GXM
      JJ = JJ + DLTAM/1000.
      WRITE(IPRTR,1005) JJ,(QI(I),I=I1,I2)
  923 CONTINUE
```

```
  930 CONTINUE
      I2 = 0
      ILY = (GXO - 1.)/10.
      ILY = ILY + 1
      DO 940 I=1,NHO
      NYP = 50/ILY
      NP = (GYO - 1.)/NYP
      NP = NP + 1
      JJ = (YHNO - DLTAO)/1000.
      DO 940 IP=1,NP
      WRITE(IPRTR,1011) HA(IH),POLLU(IPOL),IP,XHNO,DLTAO
 1011 FORMAT('1AREA SOURCE EMISSION DATA'/1X'OUTER GRID, WEIGHT=',F6.1
     1,'H,',A12,' EMISSION RATE IN UG/SQ.M/SEC',55X'PAGE',I5//8X'Y',9X
     2'X10',=3PF7.1,5X'DKM',F9.1/)
      IF (IP - NP) 932,931,931
  931 NYP = GYO - (NP - 1)*NYP
  932 CONTINUE
      DO 933 II=1,NYP
      I1 = I2 + 1
      I2 = I2 + GXO
      JJ = JJ + DLTAO/1000.
      WRITE(IPRTR,1005) JJ,(GO(I),I=I1,I2)
  933 CONTINUE
  940 CONTINUE
C PRINT RECEPTOR LOCATION
      I2 = 0
      IP5 = (NRECP - 1)/50 + 1
      DO 950 IP=1,IP5
      I1 = I2 + 1
      IF (NRECP - I2 - 50) 941,941,942
  941 I2 = NRECP
      GO TO 943
  942 I2 = I2 + 50
  943 CONTINUE
      WRITE(IPRTR,1012) IP,(I,XRR(I),YRR(I),ZRR(I),I=I1,I2)
 1012 FORMAT('1RECEPTOR LOCATIONS',29X'PAGE',I3//1X'NUMBER',6X'X',8X'Y'
     1,9X'HEIGHT'/(5X14,=3PF9.1,0PF8.1))
  950 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE SIGZI
C
C MCELROY-POOLER PARAMETERS BASED ON TURNER-PASQUILL STABILITY CATEGORY
C
C THE CALCULATION USES A POWER LAW = A(INDEX)*X**P(INDEX)
C
C INPUTS=X= IS DISTANCE FROM SOURCE, INDEX IS STABILITY CLASS NUMBER
C           IERR = ERROR RETURN
C
      COMMON/BASIC/IPRTR,ISTAR,IERR,IBIGD,NELIM,NEZLM,NLI,XONE
     1,XMAX,CONX,DECAY,INDEX,INTA,CIGMX,BIGV,BIGZ,XR,YR,ZR,XS,YS,XM,YM      BASIC
     2,IND,DLTA,XMNI,YMNI,GXI,GYI,DLTAI,NNI,XMNM,YMNM,GXM,GYM,DLTAM,NMM    BASIC
     3,XMNO,YMNO,GXO,GYO,DLTAO,NHO,PTTF,ICARD,NAI,NAO,NA,NNM,NNPR,NR       BASIC
     4,ISTRI,NFIRST,NNRECP,INDF,NGRDOT,NGRYNP                              BASIC
      DIMENSION A(5,2),P(5,2)
C
      DATA A/0.0926,0.0926,0.2891,0.0835,0.0777,0.072,0.072,0.169,1.07,
     $    1.01 /
      DATA P /1.1A,1.1A,1.11,1.08,0.955,1.22,1.22,1.01,0.682,0.955 /
C
      IF (ISTAR) 90,5,90
    5 CONTINUE
C TEST FOR RESTRICTION
   20 CONTINUE
      IF (5-INDEX) 30,30,30
   30 CONTINUE
      WRITE(IPRTR,35) INDEX
   35 FORMAT(1H ,'SUBROUTINE SIGZI - BAD INPUT------ INDEX =',I4)
      IERR = 1
      RETURN
   50 CONTINUE
      IF(INDEX-1) 30,60,60
   60 CONTINUE
      IF(CIGMX)70,70,80
   70 CONTINUE
      WRITE (IPRTR,1000) CIGMX
 1000 FORMAT (' PARAMETER OUT OF RANGE,CIGMX=',F8.1)
      IERR = 1
      RETURN
   80 CONTINUE
C X1 DEFINES DISTANCE FOR WHICH SIGMAZ = 0.5*MIXING CEILING
      DO 82 J=1,2
      B = A(INDEX,J)
      Q = P(INDEX,J)
      X1 = (CIGMX / (2. * B))**(1. / Q)
      IF (X1 - 800.) 83,83,82
   82 CONTINUE
   83 CONTINUE
C X2 DEFINES DISTANCE FOR WHICH SIGMAZ = MIXING CEILING
      DO 85 J=1,2
      B = A(INDEX,J)
      Q = P(INDEX,J)
      X2 = (CIGMX/B)**(1./Q)
      IF (X2 - 800.) 85,85,84
   84 CONTINUE
```

```
   85 CONTINUE
      RETURN
   90 CONTINUE
      IF(X**2.1)100,200,200
C X LESS THAN X1, NO MODIFICATION
  100 CONTINUE
C DETERMINE WHICH RANGE X** IS IN
      IF (X** - 600.) 110,110,120
  110 CONTINUE
C FIRST RANGE
      J = 1
      GO TO 130
  120 CONTINUE
C SECOND RANGE
      J = 2
  130 CONTINUE
      B = A(INDEX,J)
      C = P(INDEX,J)
      SIGZ = B *X**C
      RETURN
  200 CONTINUE
      IF (X** - X2)   300,400,400
C X BETWEEN X1 AND X2
  300 CONTINUE
      SIGZ = 0.5 * CIGMX * (X** * X2 - 2.*X1)/(X2 - X1)
      RETURN
C X GREATER THAN X2
  400 CONTINUE
      SIGZ= CIGMX
      RETURN
      END
```

```
      SUBROUTINE SIGZZ
C PASQUILL-GIFFORD CALCULATION FOR SIGZ
C
C THIS CALCULATION USES A POWER LAW = AX**P
C
C INPUTS-X= IS DISTANCE FROM SOURCE, INDEX IS STABILITY CLASS 1/INDEX
C RESTRICTION    INDEX MUST BE BETWEEN 1 AND 5
C
      COMMON/BASIC/IPRTR,ISTAR,IFAR,ISIGD,NXLIM,NXILM,NLI,NONE
     1,EMAX,CONN,DECAY,INDEX,THTA,CIGMX,SIGY,SIGZ,XR,YR,ZR,XS,YS,XW,YW      BASIC
     2,IND,DLTA,NNI,YNNI,GXI,GYI,DLTAI,NMI,YNNM,YNNM,GXM,GYM,DLTAM,NNM     BASIC
     3,NNO,YNNO,GXO,GYO,DLTAO,NNO,FTTF,ICARD,NAI,NAO,NA,NNM,NNPS,NO        BASIC
     4,ISTOI,NFIRST,NMRECP,INDF,NGROOT,NGRTMP                              BASIC
C
      DIMENSION A(5,3),B(5,3),C(5,2)
C
      DATA A/0.125,0.119,0.111,0.105,0.10,0.08883,0.0579,0.111,0.392,
     *    0.375,0.000226,0.0579,0.111,0.948,2.86 /
C
      DATA B /1.05,0.986,0.911,0.827,0.778,1.51,1.09,0.911,0.636,0.587,
     *    2.18,1.09,0.911,0.540,0.360 /
C
      DATA C / 250.,1000.,1000.,1000.,1000.,500.,.8e10000. /
C
      IF( ISTAR  ) 88,5,88
    5 CONTINUE
C TEST FOR RESTRICTION
      IF(5-INDEX) 30,50,50
   30 CONTINUE
      WRITE(IPRTR,35) INDEX
   35 FORMAT (1H ,'SUBROUTINE SIGZZ - BAD INPUT------ INDEX =',I8)
      IERR = 1
   40 RETURN
   50 CONTINUE
      IF(INDEX-1) 30,40,60
   60 CONTINUE
      IF(CIGMX)70,70,80
   70 CONTINUE
      WRITE (IPRTR,1000) CIGMX
 1000 FORMAT (' PARAMETER OUT OF RANGE,CIGMX=',F8.1)
      IERR = 1
      RETURN
   80 CONTINUE
C X1 DEFINES DISTANCE FOR WHICH SIGMAZ = 0.5*MIXING CEILING
      DO 82 J=1,5
      BB=(INDEX,J)
      CC=(INDEX,J)
      X1 = (CIGMX/(2.*B))**(1./C)
      IF ( J - 5) 81,81,83
   81 CONTINUE
      IF (X1 - C(INDEX,J))  83,83,82
   82 CONTINUE
   83 CONTINUE
C X2 DEFINES DISTANCE FOR WHICH SIGMAZ = MIXING CEILING
      DO 92 J=1,5
```

```
      B=A(INDEX,J)
      GO=P(INDEX,J)
      X2 = ((SIGMX/B)**(1./G)
      IF (J - 5) 91,91,93
   91 CONTINUE
      IF (X2 - C(INDEX,J)) 93,93,92
   92 CONTINUE
   93 CONTINUE
      RETURN
   94 CONTINUE
      IF (XM - X1) 96,200,200
C XM LESS THAN X1, NO MODIFICATION
C DETERMINE WHICH RANGE X IS IN
   96 CONTINUE
      IF (XM - C(INDEX,J)) 85,85,90
   89 CONTINUE
C J=1 INDICATES THAT X IS IN THE FIRST RANGE
      J=1
      GO TO 120
   90 IF (XM - C(INDEX,J)) 100,110,110
  100 CONTINUE
C J=2 INDICATES THAT X IS IN THE SECOND RANGE
      J=2
      GO TO 120
  110 CONTINUE
C J=3 INDICATES THAT X IS IN THE THIRD RANGE
      J=3
  120 CONTINUE
      SIGZ= A(INDEX,J)*XM**P(INDEX,J)
      RETURN
  200 CONTINUE
      IF (XM - X2)   300,400,400
C X BETWEEN X1 AND X2
  300 CONTINUE
      SIGZ = 0.5 * SIGMX * (XM + X2 - 2.*X1)/(X2 - X1)
      RETURN
C X GREATER THAN X2
  400 CONTINUE
      SIGZ= SIGMX
      RETURN
      END
```

```
      SUBROUTINE STASUM(NREC,YR)
C
      DIMENSION DISTX(280),XDCAY( 840),SSIGZ(280),EXPOZ( 840)                  AREAS
     1,HA(5),UHA(5),G(2000),GI(600),GO(1000),DC(17,131),SUM(6,131)             AREAS
      EQUIVALENCE (DISTX(1),DC(1,1)),(SUM(1,1),GO(1))                          AREAS
C
      COMMON/AREAS/NXI,NX,DISTX,XDCAY,SSIGZ,EXPOZ,XM,HA,UHA,G,GI,GO,CONC
C
      COMMON/BASIC/IPRTR,ISTAR,IZRR,ISIGO,NXLIM,NXZLM,NLI,XONE                 BASIC
     1,XMAX,CONX,DECAY,INDEX,THTA,SIGMX,SIGY,SIGZ,XR,YR,ZR,XB,YB,XM,YM        BASIC
     2,IND,DLTA,XMNI,YMNI,GXI,GYI,DLTAI,NMI,XMNM,YMNM,GXM,GYM,DLTAM,NMM       BASIC
     3,XMNO,YMNO,GXO,GYO,DLTAO,NNO,FTTF,ICARD,NAI,NAO,NA,NNM,NNPB,NB          BASIC
     4,ISTR1,NFIRST,NMRECP,INOF,NGRDOT,NGRTMP                                 BASIC
C
      DIMENSION CPOIN(130),CNCT(130),XRR(130),YRR(130),ZRR(130)                OUTPUT
C
      COMMON/OUTPUT/YEAR,AMON,DAY,HOUR,NRECP,CNCT,CPOIN,XRR,YRR,ZRR,IOON       OUTPUT
     1,TEMP,ALAT,PU,PN,PB,SIGM1,SIGM2,IREGN,BACKGR,INOP,ILINE,PMMDA            OUTPUT
C
      DIMENSION XP(680),YP(680),ZP(680),HP(680),DP(680),DP(680),VP(680)        POINTS
     1,TP(6A01,SSIGY(5,280),NLOC(680),CONPT(680),CNCA(13000),HPEPA(6A0)        POINTS
      INTEGER*2 NSIC(680),IPJ(680)                                             POINTS
      EQUIVALENCE (CNCA(1),XP(1))                                              POINTS
C
      COMMON/POINTS/NPB,XP,YP,ZP,HP,DP,VP,TP,NPBB,CONPB,IXEMG,SSIGY            POINTS
     1,NSIC,NLOC,CONPT,IPJ,HPEPA
C                                                                              POINTS
      DIMENSION P(15),PC(17),GSD(131     ,AV(131),SD(131),SMOM(131)
     1,TMOM(131),FMOM(131),GAV(131)
      REAL*8 POLLU(3)/'SO2','PARTICLE'/
      DATA SD/131*0./,SMOM/131*0./,TMOM/131*0./,FMOM/131*0./,GAV/131*0./
      DATA GSD/131*0./,AV/131*0./
      DATA PC/
     1  'HIGH','99.5','99.0','95.0','90.0','80.0','70.0','60.0','50.0'
     2 ,'40.0','30.0','20.0','10.0',' 5.0',' 1.0',' 0.5',' LOW'/
      DATA P/.995,.99,.95,.9,.8,.7,.6,.5,.4,.3,.2,.1,.05,.01,.005/
      DO 2 I=1,6
      DO 2 J=1,131
    2 SUM(I,J) = 0.
      NMRT = NRECYR
      NT = NMRT*NMRECP
      IF (NT.GT.13000) GO TO 120
      DO 5 I=1,NT
    5 CNCA(I) = 999999.
      NC = 0
      NMR = 0
      REWIND INOF
   10 NMR = NMR + 1
      READ(INOF,END=30) Y,Y,I,Y,Y,Y,I,Y,Y,NRECP,(CNCA(I),I=NMR,NT,NMRT)
      DO 20 I=1,NRECP
      J = NMR + (I-1)*NMRT
      X = CNCA(J)
      X2 = X**2
      SUM(1,I) = SUM(1,I) + X
      SUM(2,I) = SUM(2,I) + X2
```

```
      SUM(3,I) = SUM(3,I) + X*X2
      SUM(4,I) = SUM(4,I) + X2*X2
      Y = ALOG(X)
      SUM(5,I) = SUM(5,I) + Y
      SUM(6,I) = SUM(6,I) + Y*Y
   20 CONTINUE
      NC = NC - NRECP
      GO TO 10
   30 NHR = NHR - 1
      NDF = NHR - 1
      L = -NHRT + 1
      FNS = NHR
      DO 50 I=1,NRECP
      AV(I) = SUM(1,I)/NHR
      S2 = (SUM(2,I) - NHR*AV(I)*AV(I))/NDF
      SD(I) = SQRT(S2)
      SMOM(I) = SUM(2,I)/NHR
      TMOM(I) = SUM(3,I)/NHR
      FMOM(I) = SUM(4,I)/NHR
      A = SUM(5,I)/NHR
      GAV(I) = EXP(A)
      S2 = (SUM(6,I) - NHR*A*A)/NDF
      GSD(I) = EXP(SQRT(S2))
      L = L + NHRT
      CALL SORT(CNCA(L),NHR)
      DC(1,I) = CNCA(L+NHR-1)
      DC(17,I) = CNCA(L)
      DO 40 J=1,15
      A = FNS*P(J)
      D = A - AINT(A)
      IA = A + L
      IB = IA - 1
      IF (IB.LT.L) IB=L
   40 DC(J+1,I) = CNCA(IB) + D*(CNCA(IA)-CNCA(IB))
      SUM(1,131) = SUM(1,131) + SUM(1,I)
      SUM(2,131) = SUM(2,131) + SUM(2,I)
      SUM(3,131) = SUM(3,131) + SUM(3,I)
      SUM(4,131) = SUM(4,131) + SUM(4,I)
      SUM(5,131) = SUM(5,131) + SUM(5,I)
      SUM(6,131) = SUM(6,131) + SUM(6,I)
   50 CONTINUE
      AV(131) = SUM(1,131)/NC
      S2 = (SUM(2,131) - NC*AV(131)*AV(131))/(NC-1)
      SD(131) = SQRT(S2)
      SMOM(131) = SUM(2,131)/NC
      TMOM(131) = SUM(3,131)/NC
      FMOM(131) = SUM(4,131)/NC
      A = SUM(5,131)/NC
      GAV(131) = EXP(A)
      S2 = (SUM(6,131) - NC*A*A)/(NC-1)
      GSD(131) = EXP(SQRT(S2))
      CALL SORT(CNCA(1),NT)
      IRL = NRECP + 1
      DC(1,IRL) = CNCA(NC)
      DC(17,IRL) = CNCA(1)


      [illegible]
      [illegible]
      A = FNS*P(J)
      D = A - AINT(A)
      IA = A + 1
      IB = IA - 1
      IF (IB.LT.1) IB=1
   55 DC(J+1,IRL)=CNCA(IB) + D*(CNCA(IA)-CNCA(IB))
      ILINE = 0
   60 WRITE(IPRTR,1000) IREGN,POLLU(INDP)
 1000 FORMAT('1',54X'REGION',I4,' STATISTICAL SUMMARY FOR',A9,
     *            ///85X'STANDARD',17X'MOMENTS',16X'GEOMETRIC'/' RECEPTOR'
     1,6X'X',8X'Y     CASES      MEAN     DEV.',9X'2ND',9X'3RD',9X'4TH
     2MEAN    S.DEV.'/)
      DO 70 J=1,50
      ILINE = ILINE + 1
      I = ILINE
      WRITE(IPRTR,1001) ILINE,XRR(I),YRR(I),NHR,AV(I),SD(I),SMOM(I)
     1,TMOM(I),FMOM(I),GAV(I),GSD(I)
 1001 FORMAT(1XI8,-3PF8.1,F9.1,I8,0PF9.1,F8.1,3E12.3,F9.1,F8.3)
      IF (ILINE.GE.NRECP) GO TO 80
   70 CONTINUE
      GO TO 60
   80 IR2 = 0
      WRITE(IPRTR,1006) NC,AV(131),SD(131),SMOM(131),TMOM(131),FMOM(131)
     1,GAV(131),GSD(131)
 1006 FORMAT(6X'ALL',17XI8,F9.1,F8.1,3E12.3,F9.1,F8.3)
   90 IR1 = IR2 + 1
      IR2 = IR2 + 10
      IF (IR2.GT.IRL) IR2=IRL
      WRITE(IPRTR,1002) POLLU(INDP),(I,I=IR1,IR2)
 1002 FORMAT('1'/////15X'CUMULATIVE FREQUENCY DISTRIBUTION OF CALCULATED
     X',A9,1X
     1'CONCENTRATIONS (UG/CU.M)'///' PERCENTILE',43X'RECEPTOR'/11X10I9)
      WRITE(IPRTR,1003)
 1003 FORMAT(1X)
      DO 100 I=1,17
  100 WRITE(IPRTR,1004) PC(I),(DC(I,J),J=IR1,IR2)
 1004 FORMAT(7XA8,10F9.1)
      IF (IR2.LT.IRL) GO TO 90
      WRITE(IPRTR,1007)
 1007 FORMAT('0LAST RECEPTOR SHOWS DISTRIBUTION FOR ALL RECEPTORS COMBIN
     1ED')
      RETURN
  120 WRITE(IPRTR,1005)
 1005 FORMAT('0DIMENSION LIMITS EXCEEDED,  NO STATISTICAL SUMMARY,')
      CALL EXIT
      END
```

```
      SUBROUTINE SORT(CP, ITEMS)
      DIMENSION CP(100)
      NP = ITEMS
    1 NP = NP/2
      IF(NP) 7,7,2
    2 M = ITEMS - NP
      J = 1
    3 I = J
      M = I + NP
    4 IF (CP(I) - CP(M)) 6,6,5
    5 SAVE = CP(I)
      CP(I) = CP(M)
      CP(M) = SAVE
      M = I
      I = I - NP
      IF (I - 1) 6,4,4
    6 J = J + 1
      IF (J - M) 3,3,1
    7 RETURN
      END
```

```
      SUBROUTINE STBTU(HOUR,AMNTH,DAY,COVL,CIGL,WSL, INDEX,ALAT)
C
C COMPUTE PASQUILL-TURNER STABILITY CATEGORY
C INPUTS
C
C         HOUR      HOUR OF DAY (0 TO 24)
C         AMNTH     MONTH OF YEAR (1 TO 12
C         DAY       DAY OF MONTH (1 TO 31)
C         COVL      TOTAL CLOUD COVER (TENTHS, 0 TO 10)
C         CIGL      CLOUD CEILING HEIGHT (100,S OF FT)
C         WSL       WIND SPEED (KNOTS)
C         ALAT      LATITUDE (RADIANS, -PI/2 TO PI/2)
C OUTPUT
C       INDEX       TURNER-PASQUILL DIFFUSION STABILITY CATEGORY (1 TO 5)
C
      SUNHR = (HOUR     - 12.) * 3.14159 / 12.
      DAYR = (AMNTH     - 1.) * 30. + DAY
      SUNDC = 23.5 * SIN((DAYR - 80.) * 3.14159 / 180.) * 3.14159 / 180.
      SINSH = SIN(ALAT) * SIN(SUNDC) + COS(ALAT) * COS(SUNDC)*COS(SUNHR)
      SUNHT = ATAN(SINSH / SQRT(1. - SINSH*SINSH))
C
      IF (COVL - 10.) 20,19,20
   19 IF (CIGL - 70.) 54,20,20
   20 IF (SUNHT - 3.14159 / 12.) 21,21,22
   21 IF (SUNHT) 20,43,43
   22 IF (SUNHT - 3.14159 / 5.1429) 25,25,23
   23 IF (SUNHT - 3.14159 / 3.) 28,28,31
   24 IF (COVL - 4.) 41,41,42
   25 IF (COVL - 5.)  44,44,26
   26 IF (CIGL- 70.) 43,27,27
   27 IF (CIGL - 150.) 43,35,35
   28 IF (COVL - 5.) 46,46,29
   29 IF (CIGL - 70.) 43,30,30
   30 IF (CIGL - 150.) 35,36,36
   31 IF (COVL - 5.) 49,32,32
   32 IF (CIGL - 70.) 44,33,33
   33 IF (CIGL - 150.) 36,37,37
   35 IF(COVL - 10.) 46,45,45
   36 IF(COVL - 10.) 46,46,46
   37 IF(COVL - 10.) 49,46,46
   41 IF (WSL - 10.5) 55,55,54
   42 IF (WSL - 6.5) 55,55,54
   43 IF (WSL - 3.5) 53,53,54
   44 IF (WSL - 1.5) 52,52,45
   45 IF (WSL - 9.5) 53,53,54
   46 IF (WSL - 7.5) 47,47,48
   47 IF (WSL - 1.5) 51,51,52
   48 IF (WSL - 11.5) 53,53,54
   49 IF (WSL - 5.5) 51,51,50
   50 IF (WSL - 9.5) 52,52,53
   51 INDEX = 1
      GO TO 56
   52 INDEX = 2
      GO TO 56
   53 INDEX = 3


      GO TO 56
   54 INDEX = 4
      GO TO 56
   55 INDEX = 5
   56 CONTINUE
      RETURN
      END
```

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```
      SUBROUTINE INP 7
C
C GET HOURLY INPUT DATA
C
      COMMON/BASIC/IPWTR,IBTAR,IPRR,ISTOD,NXL1M,NXPLM,NLT,YCWF
     1,XMAT,CONS,DECAY,INDEX,TWTA,CIRMX,BIBT,BIBZ,VR,YR,ZR,VR,YR,ZR,YR      BASIC
     2,IND,DLTA,XMNI,YMNI,BXI,BYI,DLTAI,NMI,XMNM,YMNM,BXM,BYM,DLTAM,NMM    BASIC
     3,XMWD,YMWD,BXD,BYD,DLTAD,NWD,PTTP,ICARR,NAT,WAD,WA,WMM,WMRR,WR        BASIC
     4,IRTRT,APIRST,IWRFCP,IWCP,NCRDDT,WSRTWR                               BASIC
C
      DIMENSION CPDIN(130),CNCT(130),XRR(130),YRR(130),ZRR(130)             OUTPUT
C
      COMMON/INPUT/YEAR,AMDA,DAY,HOUR,WREEP,CWCT,CPDIN,XRR,YRR,ZRR,TDDM
     1,TPWP,ALAT,DU,PW,PR,CIGMI,CIGMP,IRPGN,RACKRR,INDP,TLTWP,PWMDA         OUTPUT
C
      COMMON/WMRRP/WRRD,WMGT,PWIND
C
      LOGICAL PULTT                                                         JUMP179
      COMMON /PTB/ PX(10),PY(10),PZ(10),WBTA,PULTT                          JUMP179
C
      DATA ZR/'AT'/, ZI/'I'/, ZX/'*'/
      REAL MPI(4),WBI(8)                                                    JUMP179
      CALL FRRRT(219,PSC,-1,1,1,1)
    1 READ(10,1000,END=2000) YRPI,API,DAPI,WMPI,CTSL,CDV1,CDV2,CDV3,CDV4
     1,THTA,WRRD,YI,II,CDV7,CDV8
 1000 FORMAT(F4.0,F3.0,1X,F3.0,1X,F3.0,1X,F3.0,1X,F3.0,1X,F3.0,1X,F3.0,
     1 F3.0,1X,F3.0,1X,F3.0,1X,F3.0,1X,F3.0,1X,F3.0,1X,F3.0,1X,F3.0)
      IF (YRPI - YEAR) 1,3,2
    2 IRRR = -1
      RETURN
    3 IF (API - AMDA) 1,4,2
    4 IF (DAPI - DAY) 1,5,2
    5 IF (WMPI - HOUR)1,6,2
    6 IF(WRRD.LT.0.) GO TO 7                                                JUMP179
      IF (YI.EQ.YI) GO TO 8
      IF (YI.NE.YI) GO TO 7
      II = II + 100
      GO TO 8
    7 IF (YI.NE.YI) GO TO 2
      II = 999
    8 IRRR = II
C CHECK CLOCK AMOUNT
      IF (CDV1) 10,10,60
   10 IF (CDV1) 20,20,60
   20 IF (CDV1) 30,30,80
   30 IF (CDV1) 40,40,100
   40 IF (CDV1) 50,50,120
   50 IF (CDV1) 60,60,140
   60 CDV = CDV1
      GO TO 150
   70 CDV = 10.
      GO TO 150
   80 IF (CDV1) 70,90,100
   90 CDV = CDV1
      GO TO 150
  100 IF (CDV1) 70,110,120



  110 CDV = CDV2
      GO TO 150
  120 IF (CDV1) 70,130,140


  130 IF(CDV1.NE.1.0) GO TO 150                                             JUMP179
      CDV=60.                                                               JUMP179
      GO TO 150
  140 IF(CDV1.NE.2.0) GO TO 70                                              JUMP179
      CDV=3600.                                                             JUMP179
C
  150 IF(CDV2.NE.0.) GO TO 160                                              JUMP179
      CIGL=9999.                                                            JUMP179
  160 CALL CLOCK (WMPI,0,AMDA,DAY,CDV1,CIGL,WRRD,TWOFV,ALAT)
C GET HOURLY OUTPUTS 0,CTCR
      CALL CLOCK(TWMPI,TWRD,XXXX)                                           JUMP179
C SET WHICH CLOCK TO USE
      IF (CDV2.NE.0.) GO TO 170, 180, 190
  170 CDV = CDV2
      GO TO 200
  180 CDV = 0.
      GO TO 200
  190 CDV = CDV3
C
C GET WIRING CRITERIA
  200 IF(.NOT.PULTT) GO TO 205                                              JUMP179
      WRITE(6,7)
      WRITE(6,250)                                                          JUMP179
      RETURN                                                                JUMP179
C CHANGE WMPI FROM HOUR TO M/SEC
  205 WMPI = WMPI*3600.                                                     JUMP179
C CHANGE THIS FROM TPWP OF DEGREES TO RADIANS
      TWIP = TPWP*0.174533293                                               JUMP179
      IF(WMGT.GT.0.) WRRD=WRRD*(10./WMGT)*60*WMND                           JUMP179
  210 IF(IRRR.EQ.MAX0(CP,PWMDA)) CALL WIRLEV                                JUMP179
      IF (WRRD.GE.0.) GO TO 220
  215 CIGMX = CIGMI
      GO TO 230
  220 IF (WRRD.GE.10.) GO TO 225
      CIGMX = CIGMI + (CIGMP - CIGMI)*(WRRD - 0.)/9.
      GO TO 230
  225 CIGMX = CIGMP
  230 YRP,WMP,PULTT) GO TO 500                                              JUMP179
  240 READ(11,PRRR,END=245) YRPI,API,DAPI,WMPI,(WBTI(I),WBTI(I),I=2,NWTA)   JUMP179
 8000 FORMAT(F4.0,F3.0,1X,F3.0,1X,F3.0,8(F3.0,1X))                          JUMP179
      IF(YRPI-YEAR) 240,250,2                                               JUMP179
  250 IF(API-AMDA) 240,260,2                                                JUMP179
  260 IF(DAPI-DAY) 240,270,2                                                JUMP179
  270 IF(WMPI-HOUR) 240,280,2                                               JUMP179
  280 CALL UNCAL(IWD,WB,AP)                                                 JUMP179
  500 IRRR=0                                                                JUMP179
      RETURN
      END
```

PARAMETERS
MULTI-STATION TEST CASE

ORIGIN: (0.0 , 0.0)

WEIGHTING GRID NX= 1 WEIGHTING GRID NY= 1

WEIGHTING GRID SX= 1.00 WEIGHTING GRID SY= 1.00

NO WEIGHTING FACTORS (Y) POWER= 2.0

SEARCH ANGLE= 60.0

STATIONS
ACTUAL LOCATIONS

STATION NO.	X (KM)	Y (KM)	HEIGHT (M)	IDENTIFICATION
1	3.00	2.00	10.0	
2	6.00	6.00	10.0	
3	1.50	9.00	10.0	

SCIM
'SCIM' INPUT

NUMBER OF ITERATIONS USED IN COMPUTING TRAVEL DISTANCE IS 1

PARAMETERS FOR THIS SCIM RUN

	YEAR	MONTH	DAY	HOUR
FIRST HOUR	71.	3.	1.	2.
LAST HOUR	71.	3.	4.	11.

SAMPLE INCREMENT 3. HOURS
DECAY CONSTANT 0.0 PER SECOND
TYPE OF DIFFUSION RURAL
LATITUDE OF REGION 32.00 DEG.
WIND MEASURING HEIGHT 10.0 METERS
MEAN MORNING MIXING DEPTH 500. METERS
MEAN AFTERNOON MIXING DEPTH 1900. METERS
BACKGROUND CONCENTRATION 1. UG/CU.M

	UNSTABLE	NEUTRAL	STABLE
WIND PROFILE EXPONENT	0.15	0.20	0.25

POINT SOURCE EMISSION DATA PAGE 1

NUMBER	X	Y	STACK HEIGHT (M)	SO2 EMISSION RATE (G/SEC)	STACK DIAMETER (M)	EXIT VELOCITY (M/SEC)	EXIT TEMPERATURE (DEG.K)
1	2.0	1.0	100.0	4999.999	5.0	20.0	400.0
2	1.0	9.0	50.0	2500.000	5.0	15.0	400.0
3	8.0	8.0	50.0	1000.000	5.0	15.0	400.0
4	5.0	5.0	50.0	800.000	5.0	15.0	400.0
5	9.0	2.0	25.0	200.000	5.0	10.0	400.0

AREA SOURCE EMISSION DATA
INNER GRID, HEIGHT= 10.0M, SO2 EMISSION RATE IN UG/SQ.M/SEC

Y	X1= 0.0	DX= 5.0
0	1.000	0.0
5	0.0	4.000

AREA SOURCE EMISSION DATA
INNER GRID, HEIGHT= 20.0M, SO2 EMISSION RATE IN UG/SQ.M/SEC

Y	X1= 0.0	DX= 5.0
0	0.0	8.000
5	2.000	0.0

AREA SOURCE EMISSION DATA
MIDDLE GRID, HEIGHT= 10.0M, SO2 EMISSION RATE IN UG/SQ.M/SEC

Y	X1= 0.0	DX= 5.0
0	1.000	0.0
5	0.0	4.000

AREA SOURCE EMISSION DATA
MIDDLE GRID, HEIGHT= 20.0M, SO2 EMISSION RATE IN UG/SQ.M/SEC

Y	X1= 0.0	DX= 5.0
0	0.0	8.000
5	2.000	0.0

AREA SOURCE EMISSION DATA
OUTER GRID, HEIGHT= 10.0M, SO2 EMISSION RATE IN UG/SQ.M/SEC

Y	X1= 0.0	DX= 5.0
0	1.000	0.0
5	0.0	4.000

AREA SOURCE EMISSION DATA
OUTER GRID, HEIGHT= 20.0M, SO2 EMISSION RATE IN UG/SQ.M/SEC

Y	X1= 0.0	DX= 5.0
0	0.0	8.000
5	2.000	0.0

RECEPTOR LOCATIONS

NUMBER	X	Y	HEIGHT
1	2.5	2.5	0.0
2	2.5	7.5	0.0
3	7.5	2.5	0.0
4	7.5	7.5	0.0

MO/DA/HR		SO2	RECEPTOR CONCENTRATIONS, UG/CU.M	
30102,	45.8	51.3	140.7	113.6
30105,	78.0	202.7	228.1	228.1
30108,	55.1	90.6	262.1	182.8
30111,	10.4	29.1	98.2	51.6
30114,	8.2	31.6	33.7	28.4
30117,	5.1	27.8	19.6	33.7
30120,	25.1	22.8	90.8	73.7
30123,	14.7	19.9	63.8	58.4
30204,	7.5	14.5	31.1	29.3
30207,	17.1	36.3	75.1	72.4
30210,	22.3	48.4	91.3	93.8
30211,	19.7	20.2	118.4	87.4
30214,	25.5	18.0	61.0	65.3
30217,	40.6	36.0	148.6	93.8
30220,	137.3	66.9	279.0	168.4
30223,	110.0	138.8	140.6	97.2
30302,	192.1	189.1	211.9	163.6
30305,	339.1	333.9	374.1	253.4

REQUESTED INPUT DATA NOT FOUND 71, 3, 3, 8,

30311,	26.4	53.5	123.6	88.0

REQUESTED INPUT DATA NOT FOUND 71, 3, 3, 14,

30317,	20.7	41.2	86.2	68.7
30320,	39.7	79.5	165.6	126.9
30323,	190.9	94.2	273.9	202.2

REQUESTED INPUT DATA NOT FOUND 71, 3, 4, 2,

30405,	330.6	198.0	301.5	185.6
30408,	120.8	91.5	347.8	243.4
30411,	24.2	18.4	75.1	94.3

REGION 1 STATISTICAL SUMMARY FOR SO2

RECEPTOR	X	Y	CASES	MEAN	STANDARD DEV.	MOMENTS 2ND	3RD	4TH	GEOMETRIC MEAN	GEO.DEV.
1	2.5	2.5	45	76.3	96.6	0.1448E 05	0.3812E 07	0.1148E 10	48.1	3.199
2	2.5	7.5	25	73.1	79.0	0.1113E 05	0.2888E 07	0.6948E 09	48.3	2.406
3	7.5	2.5	25	153.6	104.1	0.3408E 05	0.9009E 07	0.2688E 10	118.2	2.214
4	7.5	7.5	85	112.7	69.0	0.1738E 05	0.3194E 07	0.6508E 09	92.9	1.926
ALL			180	100.0	92.4	0.1932E 05	0.6672E 07	0.1298E 10	67.9	2.683

CUMULATIVE FREQUENCY DISTRIBUTION OF CALCULATED SO2 CONCENTRATIONS (UG/CU.M)

PERCENTILE	RECEPTOR 1	2	3	4	5
HIGH	339.1	333.9	374.1	253.4	378.1
99.5	338.0	317.5	370.8	252.1	361.0
99.0	337.0	301.1	367.5	250.9	347.8
95.0	298.0	201.0	336.2	238.6	301.3
90.0	191.5	192.6	290.2	215.1	243.4
80.0	110.0	94.2	262.1	182.8	185.6
70.0	69.3	66.2	196.3	139.2	126.9
60.0	45.8	48.4	148.6	97.2	91.3
50.0	25.2	35.2	121.0	90.9	72.4
40.0	23.1	31.4	90.8	73.7	56.3
30.0	20.2	26.5	78.1	61.9	33.7
20.0	14.6	20.2	61.0	51.6	26.1
10.0	7.8	18.2	32.4	31.5	19.5
5.0	5.7	15.4	22.5	28.7	14.7
1.0	5.1	14.5	19.6	28.6	5.1
0.5	5.1	14.5	19.6	28.6	5.1
LOW	5.1	14.5	19.6	28.6	5.1

LAST RECEPTOR SHOWS DISTRIBUTION FOR ALL RECEPTORS COMBINED

APPENDIX C

USER'S GUIDE TO CDM MODIFICATIONS

C.1 DESCRIPTION OF INPUT TO CDM

C.2 FORTRAN IV PROGRAM LISTING

C.3 TEST CASE

(TO BE USED AS APPENDIX F IN CDM USER'S MANUAL)

C.1 DESCRIPTION OF INPUT TO CDM

Card Input Sequence

The card input sequence is, essentially, a superset of that of the pre-modification program; the modifications and the additional "keyword packages" required by the new version of CDM, along with a restatement of the familar card input sequence, will be given as follows:

C.1.1 PARAMETERS

Allows the modification of the program parameters or run options. Parameters or option variables are set to default values at compile time and, hence, only those which are to be modified need be entered. The format of the data package itself is a Fortran IV namelist with the name &INGRID.

The specific method used is selected through combinations of the parameters LTHETA, THETA, FACT, NOFACT, POWER and RADIUS.

1) Inverse distance power law: Set THETA to 360. and POWER to the desired value. All other parameters are allowed to assume default values.

2) Selective Angle Method: Set THETA and POWER to default or desired values. Other parameters assume default values.

3) Selective Radius Method: Select non-zero RADIUS value, THETA = .FALSE., and POWER. The other parameters may assume default values.

4) Weighting Factor Matrix: Set NOFACT = .FALSE. and specify weighting factor arrya, FACT, according to format below. This method must be used in conjunction with one of the three methods above.

FIRST CARD

Columns	Contents	Format	Description
1-10	'PARAMETERS'		
21-70	TITLE	12A4, A2	Run heading for printing

SECOND CARD

Columns	Contents	Format	Description
2-8	'&INGRID'		

FOLLOWING CARDS

Columns	Contents	Format	Description
2-80			Parameters to be initialized by FORTRAN Namelist &INGRID; these parameters are:

Name	Type	Dimension	Default	Description
ORIGIN	R*4	2	(0.,0.)	Origin of weighting grid system
NX	I*4	-	1	Number of cells of the weighting grid system (X direction)
NY	I*4	-	1	Number of cells of the weighting grid system (Y direction)
GX	R*4	-	1.0	The east-west dimension of each cell of the weighting grid
GY	R*4	-	1.0	The north-south dimension of each cell of the weighting grid
THETA	R*4	-	45.0	The search angle used in determining the wind direction and wind speed at a location
FACT	R*4	10,10,10	1000*1.0	The weighting factors utilized in determining the wind direction and wind speed at a location
NOFACT	L*4	-	.TRUE.	.TRUE. if no weighting factors are specified
PRINT	L*4	-	.TRUE.	.TRUE. to print input wind roses
LTHETA	L*4	-	.TRUE.	.TRUE. if search angle used
POWER	R*4	-	2.	Power law for inverse distance
RADIUS	R*4	-	1.	Radius for selective radius method

LAST CARD

Columns	Contents	Format	Description
2-5	'&END'		

C.1.2 STATIONS

This "keyword card" initiates the reading of the station locations - in units consistent with the receptor locations - and the associated meteorological data (day-night star wind rose format). It should be noted that all of the meteorological data must be presented in the 'STATIONS' package; the sections of code in subroutine CLINT which read and printed the input wind rose have been removed.

If either more than 10 stations have been specified or the stations are out of sequence, an error message is issued and the job is terminated. Finally, if PRINT = .TRUE. (see Section 1), each of the input wind roses is printed in a concise tabular format.

FIRST CARD

Columns	Contents	Format	Description
1-8	'STATIONS'		
21-70	TITLE	12A4,A2	Run heading for printing

FOLLOWING CARDS: For each station

C.1.2.1 Station Location

Columns	Variable	Format	Description
6-10	NO	I5	Station identification number
11-20	X	E10.0	Station east-west coordinate (receptor compatible units)
21-30	Y	E10.0	Station north-south coordinate (receptor compatible units)
31-60	STAID	7A4, A2	Optional 30 character station identification

C.1.2.2 Station Wind Rose Data

C.1.2.2.1 Card #1, Frequencies (F) For Wind Direction Class 1, Stability Class 1

Columns	Variable	Format	Description
10-18	F(1,1,1)	F9.0	Wind speed class 1
19-27	F(2,1,1)	F9.0	Wind speed class 2
28-36	F(3,1,1)	F9.0	Wind speed class 3
37-45	F(4,1,1)	F9.0	Wind speed class 4
46-54	F(5,1,1)	F9.0	Wind speed class 5
55-63	F(6,1,1)	F9.0	Wind speed class 6

The formats for card #2 - card #96 are identical to that of card #1, with wind direction class varying firstly and stability class secondly.

LAST CARD

Columns	Contents	Format	Description
1-5	'99999'		Delimiter card

Multi-station mode (internal variable MULTI=.TRUE.) is indicated if more than one station's data is specified.

C.1.3 WEIGHTS

This "keyword card" initiates the reading of the weighting factors which are subsequently used in computing the wind direction and wind speed at a specific location. These factors are specified on a grid cell by grid cell basis, i.e., from each of the - up to 10 - previously specified stations to each of the - up to 100 (10 x 10) - grid cells. Only those factors which are not 1.0 should be specified since 1.0 is the default value of all of the weighting factors.

FIRST CARD

Columns	Contents	Format	Description
1-7	'WEIGHTS'		
21-70	TITLE	12A4, A2	Run heading for printing

FOLLOWING CARDS

Columns	Variable	Format	Description
6-10	NO	I5	Station identification number
11-15	IX	I5	Horizontal (row) grid cell number
16-20	IY	I5	Vertical (column) grid cell number
21-30	FIELD	E10.0	Station-to-grid cell weight (normally between 0. and 1.)

LAST CARD

Columns	Contents	Format	Description
1-5	'99999'		Delimiter card

Non-unity weighting factors would normally be used to incorporate the knowledge of the representativeness of data as affected by topographic features such as hills and valleys. Moreover, they may also be used to express the confidence one has in the validity of a station's measurements. For example, if in a group of stations there existed only one National Weather Service station, this station would, on a grid cell basis, be assigned a value of, perhaps, 2.0, whereas the remainder of the stations would be assigned a value of 0.5.

C.1.4 CDM

This "keyword card" initiates the calling of subroutine CDM (formerly the main program) and, therefore, from this point, the program flow and related input proceed as before.

FIRST CARD

Columns	Contents	Format	Description
1-3	'CDM'		
21-70	TITLE	12A4,A2	Run heading for printing

The changes to the input (the modifications were made to subroutine CLINT) are as follows:

C.1.4.1 The removal of the statements which read the input wind rose; all windrose data is now processed by subroutine INSTA ('STATIONS' package).

C.1.4.2 IRD (card input unit number), IWR (print unit number) and IPU (punch unit number) are no longer specified as before; they appear, in the following way, on the first keyword card to be encountered in the input stream (default values are IRD=5, IWR=6 and IPU=7):

Columns	Contents	Format	Description
1-10	'PARAMETERS', 'STATIONS', 'WEIGHTS', or 'CDM'		
15-16	IRD	I2	Card input unit number
17-18	IWR	I2	Print unit number
19-20	IPU	I2	Punch unit number
21-70	TITLE	12A4,A2	Run heading for printing

For clarity, all of the input requirements will be restated and the modifications will be shown wherever needed:

The arrangement of input data on the cards that follow the program deck is given in Table C-1. Certain data that are permanent features of the model, such as the wind by class and wind direction by class, are a part of the program and not read in as separate entities. Interactive operation, requires an input data set somewhat different from that given in Table C-1.

TABLE C-1

CARD INPUT SEQUENCE

Card Number	Column	Format	Contents
1	1 to 18	2A4	AROS(1)-AROS(2) (Identification for punched output of the computed area source concentrations of the two pollutants. See sample punched output.)
	9 to 16	2A4	PROS(1)-PROS(2) (Identification for punched output of the computed point source concentrations of the two pollutants)
	17 to 21	I5	IRUN (Computer run identification number)
	22 to 26	I5	NLIST (Index which indicates whether input data should be listed. If NLIST $\neq$ 0, input data is printed.)
	42 to 59	2F9.0	CA(1)-CA(2) (Constants of the linear equation Y=CA + CB x X, used to calibrate the calculated concentrations of the two pollutants considered in the model)
	60 to 77	2F9.0	CB(1)-CB(2) (Slope of the linear equation, Y = CA + CB x X, used to calibrate the calculated concentrations of the two pollutants considered in the model)
2	1 to 6	F6.0	DELR (Initial integration increment of radial distance from receptor, meters)
	7 to 12	F6.0	RAT (Ratio of length of a basic emission grid square and the length of a map grid square)
	13 to 18	F6.0	CV (Conversion factor which upon multiplication by RAT expresses the distance of the side of an emission grid square in meters. For example, if the map units are in kilometers, CV=1000.)
	19 to 24	F6.0	HH (Average afternoon mixing height in meters)
	25 to 30	F6.0	HMIN (Average nocturnal mixing height in meters)
	31 to 36	F6.0	XG (X map coordinate of the southwest corner of the emission grid array)
	37 to 42	F6.0	YG (Y map coordinate of the southwest corner of the emission grid array)
	43 to 48	F6.0	XGG (X map coordinate of the southwest corner of the plotting grid)

TABLE C-1 (Cont.)

CARD INPUT SEQUENCE

Card Number	Column	Format	Contents
2	49 to 54	F6.0	YGG (Y map coordinate of the southwest corner of the plotting grid)
	55 to 60	F6.0	RATG (Ratio of the length of the grid square used for plotting and the length of a map grid square)
	61 to 66	F6.0	TOA (Mean atmospheric temperature in degrees centigrade)
	67 to 72	F6.0	TXX (Width of basic emission square in meters)
3	1 to 6	F6.0	DINT (Number of intervals used to integrate over a 22.5° sector. Maximum value is 20, typical value is 4.)
	7 to 12	F6.0	YD (Ratio of average daytime emission rate to the 24-hour emission rate average)
	13 to 18	F6.0	YN (Ratio of the average nighttime emission rate to the 24-hour emission rate average)
	19 to 54	6F6.0	SZA(1)-SZA(6) (Initial σ_z in meters for each stability class. Six different values can be used, but normally only one value is used.)
	55 to 66	2F6.0	GB(1)-GB(2) (Decay half life in hours for the two pollutants)
4-99	1 to 63	[9X, 6(1X, F8.6)]	F(i,j,k) (Joint frequency function, identical to ϕ (k, ℓ, m); i = index for stability class, j = index for wind speed, k = index for wind direction. See input data of sample problem for proper ordering of this parameter by stability class, wind direction, and wind speed.)
[Source Cards Follow]			
100[a]	1 to 6	F6.0	X(X map coordinate of the southwest corner of the area emission grid, or if appropriate, the X map coordinate of a point source)
	7 to 13	F7.0	Y (Y map coordinate of the southwest corner of the area emission grid, or if appropriate, the Y map coordinate of a point source)

TABLE C-1 (Cont.)

CARD INPUT SEQUENCE

Card Number	Column	Format	Contents
	14 to 20	F7.0	TX (Width of an area grid square in meters. It is important that no entry be made in the case of a point source.)
	21 to 36	2F8.0	S1-S2 (Source emission rate in grams per second for the two pollutants)
	37 to 43	F7.0	SH (stack height in meters)
	44 to 49[b]	F5.0	D (Diameter of stack in meters)
	50 to 56[b]	F7.0	VS (Exit speed of pollutants from stack in meters per second)
	57 to 63[b]	F7.0	T (Gas temperature of stack gases in degrees centigrade)
	64 to 68[b]	F5.0	SA (If this field is blank, Briggs' formula is used to compute stack height. Otherwise, the product of plume rise and wind speed is entered in square meters per second.)
1000	--	--	This is a blank card which follows information on the emission sources. It is used to test the end of sources and must not be left out.
[Receptor cards follow]			
1001[c]	1 to 8	F8.2	RX (X map coordinate of the receptor)
	9 to 16	F8.2	RY (Y map coordinate of the receptor)
	31 to 34	I4	KPX(9) (Observed concentration at the receptor of the first pollutant)
	38 to 41	I4	KPX(10) (Observed concentration at the receptor of the second pollutant)
	42 to 46	I5	NROSE (A control that, if greater than zero, will print out histogram concentration data. If left blank, no histogram data will be printed.)

[a]There will be as many cards of this type as there are area and point sources. The next card type will arbitrarily be numbered 1000.

[b]Needed for point sources only. Leave blank on area source cards.

[c]There will be as many cards of this type as there are receptors.

```
      SUBROUTINE WEIGHT
      INTEGER END
      LOGICAL MULTI
      COMMON /PTS/ PX(10),PY(10),FREQ(6,16,6,10),NSTA,MULTI
      LOGICAL NOFACT,LTHETA
      COMMON /FACTOR/ FACT(10,10,10),NOFACT
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,THETA,LTHETA,RADIUS,POWER
      COMMON /C2/ UE(6),YD,YN,TMN,WMIN,DINT,YCON,TA(4),IPS,XG,YG,IRD
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),GB(2),NO,IVER,IWR
      NOFACT=.FALSE.
      WRITE(IWR,6010)
 6010 FORMAT('0',T21,'STATION NO,',T41,'CELL NO, (X)',T61,'CELL NO, (Y)'
     X   ,T81,'WEIGHTING FACTOR'/)
      DO 10 IY=1,NY
      DO 10 IX=1,NX
      DO 10 ISTA=1,NSTA
   10 FACT(ISTA,IX,IY)=1.0
   20 READ(IND,5020) END,NO,IX,IY,FIELD
 5020 FORMAT(4I5,E10.0)
      IF(END.EQ.99999) GO TO 100
      IF(NO.LT.1.OR.NO.GT.NSTA.OR.IX.LT.1.OR.IX.GT.NX.OR.IY.LT.1
     X   .OR.IY.GT.NY) GO TO 500
      FACT(NO,IX,IY)=FIELD
      WRITE(IWR,6020) NO,IX,IY,FIELD
 6020 FORMAT(T26,I3,T46,I2,T66,I2,T86,F8.4)
      GO TO 20
  100 RETURN
  500 WRITE(IWR,6500)
 6500 FORMAT('-',T21,'INVALID INDEX (OR INDICES)'/T21,
     X   'EXECUTION TERMINATED.')
      STOP 1
      END
```

```
      SUBROUTINE WFREQ(RX,RY,F)
      LOGICAL MULTI
      COMMON /PTS/ PX(10),PY(10),FREQ(6,16,6,10),NSTA,MULTI
      COMMON /GRID/ ORIGIN(2),NX,NY,GX,GY,THETA,LTHETA,RADIUS,POWER
      LOGICAL NOFACT,LTHETA
      COMMON /FACTOR/ FACT(10,10,10),NOFACT
      REAL RDIST(10),F(1)
      INTEGER STAND(10)
      LOGICAL WKEY
      WFAC=1.
      NEXT=1
C
C     DETERMINE THE WEIGHTING GRID CELL LOCATION OF THE RECEPTOR POINT
C
      IX=INT((RX-ORIGIN(1))/GX)+1
      IY=INT((RY-ORIGIN(2))/GY)+1
      IF(IX.LE.0.OR.IX.GT.NX.OR.IY.LE.0.OR.IY.GT.NY) GO TO 25
      WKEY=.NOT.NOFACT
      GO TO 30
   25 WKEY=.FALSE.
   30 DO 35 I=1,576
   35 F(I)=0.
      SIGR=0.
      DO 40 ISTA=1,NSTA
   40 STAND(ISTA)=ISTA
C
C     ORDER STATIONS BASED UPON MINIMUM RADIUS
C
      DO 50 ISTA=1,NSTA
   50 RDIST(ISTA)=SQRT((RX-PX(ISTA))**2+(RY-PY(ISTA))**2)
      CALL SORT(RDIST,STAND,NSTA)
   60 DO 70 JSTA=NEXT,NSTA
      ISTA=STAND(JSTA)
      IF(ISTA.EQ.0) GO TO 70
C
C     SELECT FIRST STATION BASED UPON MINIMUM (AT THAT TIME) DISTANCE
C
      IF(WKEY) WFAC=FACT(ISTA,IX,IY)
      WEIGHT=WFAC/(RDIST(ISTA)**POWER+1.E-06)
      I=0
      DO 65 L=1,16
      DO 65 K=1,6
      DO 65 J=1,6
      I=I+1
   65 F(I)=F(I)+FREQ(K,L,J,ISTA)*WEIGHT
      SIGR=SIGR+WEIGHT
      STAND(JSTA)=0
      IF(JSTA.LT.NSTA) GO TO 80
   70 CONTINUE
      GO TO 150
   80 DX1=PX(ISTA)-RX
      DY1=PY(ISTA)-RY
      IF(DX1.EQ.0..AND.DY1.EQ.0.) GO TO 150
      ALPHI=ATAN2(DY1,DX1)
      TX=PX(ISTA)
```

```
      TY=PY(ISTA)
      NEXT=JSTA+1
      DO 100 JSTA=NEXT,NSTA
      ISTA=STAND(JSTA)
      IF(ISTA.EQ.0) GO TO 100
C
C     REJECT ANY STATION WITHIN A SECTOR OF
C     THETA DEGREES OF THE SELECTED STATION
C
      IF(.NOT.LTHETA) GO TO 90
C
      DX2=PX(ISTA)-HX
      DY2=PY(ISTA)-HY
      ALPH2=ATAN2(DY2,DX2)
      IF(ABS(ALPH1-ALPH2).LT.THETA) STAND(JSTA)=0
      GO TO 100
C
C     REJECT ANY STATION WITH A MINIMUM SEARCH DISTANCE (RADIUS)
C     OF THE SELECTED STATION
C
   90 IF(SQRT((TX-PX(ISTA))**2+(TY-PY(ISTA))**2).LE.RADIUS)
     X   STAND(JSTA)=0
C
  100 CONTINUE
      GO TO 60
  150 DO 200 I=1,576
  200 F(I)=F(I)/SIGR
      RETURN
      END




      SUBROUTINE INSTA
      REAL FREQ(576,10)
      INTEGER END,STAND,STAID(8)
      LOGICAL MULTI
      COMMON /PTS/ PX(10),PY(10),PROB(6,10,6,10),NSTA,MULTI
      LOGICAL PRINT
      COMMON /CNTRL/ PRINT
      COMMON /C1/ K,HX,HY,HT,F(576),G(6,5),U(6),RI,RJ,INC(6),DELR
      COMMON /C2/ UP(6),YD,YX,YHN,HMIN,DINT,YCON,TA(6),IP6,I6,Y6,IRU
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),GB(2),NB,IYER,I=R
      EQUIVALENCE (PROB(1),F=FREQ(1))
      IF(.NOT.PRINT) WRITE(I=R,6010)
 6010 FORMAT('1',T21,'STATION NO.',T66,'X',T66,'Y',T81,'IDENTIFICATION'
     X   /)
      DO 200 NSTA=1,11
      READ(IRD,5010) END,STAND,X,Y,STAID
 5010 FORMAT(215,2E10.0,T44,A2)
      IF(END.EQ.999999) GO TO 900
      IF(NSTA.EQ.11) GO TO 400
      IF(STAND.NE.NSTA) GO TO 500
      IF(PRINT) WRITE(I=R,6010)
      WRITE(I=R,6100) STAND,X,Y,STAID
 6100 FORMAT(T26,I3,T41,F8.2,T61,F8.2,T81,T44,A2)
      PX(NSTA)=X
      PY(NSTA)=Y
C
C     READ THE APPROPRIATE WIND ROSE
C
      READ(IRD,5150) F
 5150 FORMAT(9X,6F9.0)
      DO 150 I=1,576
  150 FREQ(I,NSTA)=F(I
  200 IF(PRINT) CALL PRTAB(F)
  400 WRITE(I=R,6400)
 6400 FORMAT('=',T21,'MORE THAT 10 STATIONS HAVE BEEN SPECIFIED,'/T21,
     X   'EXECUTION TERMINATED,')
      STOP 1
  500 WRITE(I=R,6500) STAND
 6500 FORMAT('=',T21,'STATION NO.',I3,' IS OUT OF SEQUENCE,'/T21,
     X   'EXECUTION TERMINATED,')
      STOP 1
  900 NSTA=NSTA-1
      MULTI=NSTA.GT.1
      IF(MULTI) GO TO 1000
      I=0
      DO 950 L=1,10
      DO 950 K=1,6
      DO 950 J=1,6
      I=I+1
  950 F(I)=PROB(K,L,J,1)
 1000 RETURN
      END
```

```
      SUBROUTINE TABLE(X,NR,NC,KR,KC,FM,KM,FD,KD)
C     ********************************************************************
C     IBM 360                  F.REIFENSTEIN                      FORTRAN IV
C     ENVIRONMENTAL RESEARCH AND TECHNOLOGY,INC.,WALTHAM,MASS
C
C     VERSION 28    LEVEL 71075    (SPECIAL CHARACTERS)
C     INPUTS--
C        XARRAY TO BE TABULATED(NR,NC)
C        NRMAX NUMBER OF ROWS(RO=DIMENSION OF X IN MAIN)
C        NCMAX NUMBER OF COLUMNS(COL=DIMENSION IN MAIN)
C        KR=NUMBER OF ROWS TO BE PRINTED
C        KC=NUMBER OF COLUMNS TO BE PRINTED
C        FM=ARRAY OF 8-BYTE HEADING FORMATS(DIMENSIONED (KC,KM))
C        KM=NUMBER OF ROWS OF COLUMN HEADINGS
C        FD=ARRAY OF 8-BYTE DATA FORMATS(DIMENSIONED(NC))
C        KD=NUMBER OF ROWS BETWEEN HORIZONTAL LINES
C     METHOD--COMPUTES OBJECT-TIME FORMATS FOR COLUMN HEADINGS,VERTICAL
C        AND HORIZONTAL LINES,AND TABULATED DATA.
C     ********************************************************************
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),GB(2),NG,IVER,INR
      REAL*4 X(NR,NC)
      REAL*8 FM(NC,KM),FD(NC)
      REAL*8 TAB(11)/'T2,A1,',','T15,A1,',','T28,A1,',','T41,A1,',
     X   'T54,A1,',','T67,A1,',','T80,A1,',','T93,A1,',','T106,A1,',
     X   'T119,A1,',','T132,A1,'/,TT
      REAL*8 FMT(23)/'(',21*' ','1X)'/,GMT(23)/'(',21*' ','1X)'/,
     X   HMT(23)/'(',21*' ','1X)'/,FF/'2X,A8,'/,GG/' '/,HH/'3A4,A1,'/
      INTEGER VLINE/'I'/,TLINE/'*'/,CROSS/'+'/,HBAR(3)/3*'----'/,
     X   TBAR(4)/4*'====='/
      IF(KC.GT.10)   KC=10
C     BLANK OUT OLD FORMATS
      DO 5   I=2,22
      FMT(I)=GG
      GMT(I)=GG
    5 HMT(I)=GG
C     COMPUTE NEW FORMATS
      N =(10-KC)/2+1
      TTBAR=TBAR(N)
      HMT(21)=TT
      J=2
      DO 10   I=1,KC
      FMT(J)=FF
      GMT(J)=TT
      FMT(J+1)=F(I)
      GMT(J+1)=F_(I)
      HMT(I+2)=HH
      J=J+2
      N=N+1
   10 TTBAR(N)
   20 FMT(J)=TT
      GMT(J)=TT
      I=0
C     WRITE COLUMN HEADINGS
   30 CONTINUE
   35 WRITE(IWR,HMT) TLINE,(TBAR,J=1,KC)



      DO 40   K=1,KM
   40 WRITE(IWR,FMT) VLINE,(FM(J,K),VLINE,J=1,KC)
   50 WRITE(IWR,HMT) CROSS,(HBAR,CROSS,J=1,KC)
      DO  60   K=1,KD
      I=I+1
      WRITE(IWR,GMT) VLINE,(X(I,J),VLINE,J=1,KC)
      IF(I.GE.KR)   GO TO 70
   60 CONTINUE
      GO TO 50
   70 CONTINUE
   75 WRITE(IWR,HMT) CROSS,(HBAR,CROSS,J=1,KC)
      RETURN
      END
```

```
      SUBROUTINE FREQTAB(FREQ)
      COMMON /CW/ DPCAY(2),ICA(8),ICP(8),M(8),MX(8),GG(2),NG,IVER,IWR
      REAL*8 FM(8,2)/'  <1KT',    1',    4',    7',   11',   17',   21',
     X    '  BUM',' DIR',' ?0' '/,FD(8)/'03',8A,',7A'F10,6/'/
      REAL FREQ(16,16,8),Q(17,8)/'N','NNE','NE','ENE','E','SSE','SE',
     X   'SSE','S','SSW','SW','WSW','W','WNW','NW','NNW','SUM',119*0,/
      FTOT=0.
      DO 780 L=1,8
      SUML=0.
      DO 970 J=1,8
      SUM=0.
      DO 960 K=1,16
      TERM=FREQ(J,K,L)
      Q(K,J+1)=TERM
  960 SUM=SUM+TERM
      SUML=SUML+SUM
  970 Q(17,J+1)=SUM
      FTOT=FTOT+SUML
      DO 990 K=1,16
      SUM=0.
      DO 980 J=1,8
  980 SUM=SUM+FREQ(J,K,L)
  990 Q(K,9)=SUM
      Q(17,9)=SUML
C     TABULATE FOR STABILITY CLASS L IF SUML.NE.0.
      IF(SUML.EQ.0.) GO TO 620
      WRITE(IWR,6490)
 6490 FORMAT('1')
      WRITE(IWR,6600) L
 6600 FORMAT('0',T21,'STABILITY CLASS',I3/'0',T50,'WINDSPEED CLASS')
      CALL TABLE(Q,17,9,17,8,FM,2,FD,4)
  620 WRITE(IWR,6620) L,SUML
 6620 FORMAT('0',T21,'TOTAL FREQUENCY OF OCCURRENCE, CLASS ',I4,
     X   ' = ',F10.5)
  780 CONTINUE
      WRITE(IWR,6780) FTOT
 6780 FORMAT('0',T21,'TOTAL FREQUENCY OF OCCURRENCE, CLASSES 1 TO 8 =',
     X   F10.5)
      RETURN
      END
```

```
      SUBROUTINE SORT(X,LOC,N)
      INTEGER X(1),LOC(1)
      M=N
    1 M=M/2
      IF(M.EQ.0) RETURN
      K=N-M
      DO 10 I=1,K
      J=I
    5 L=J+M
      IJ=LOC(J)
      IL=LOC(L)
      IF(X(IL).GE.X(IJ)) GO TO 10
      LOC(J)=IL
      LOC(L)=IJ
      J=J-M
      IF(J.GT.0) GO TO 5
   10 CONTINUE
      GO TO 1
      END
```

```
      SUBROUTINE CON                                                    00000010
      DIMENSION DX(4),DY(4),A(4),XPX(10),TCON(2),CCUN(2)
      LOGICAL MULTI
      COMMON /PTS/ SX(10),SY(10),FRFQ(6,10,6,10),NSTA,MULTI
      LOGICAL PRINT
      COMMON /CNTRL/ PRINT
      COMMON /C1/ M,MX,MY,MT,F(6,6,10),G(6,5),U(6),RI,RJ,INC(4),DELR    00000020
      COMMON /C2/ UE(6),VD,YN,TMN,XMIN,DINT,YCUN,TA(4),IPG,XO,YO,IRD    00000030
      COMMON /C3/ NATO,IRUN,CA(2),CB(2),TK(16),ARDS(2),PROS(2),TANG     00000040
      COMMON /C4/ DECAY(2),ICA(6),ICC*(6),M(6),MX(6),GR(2),NG,IVER,I=M  00000050
      COMMON /C5/ G(100,4),GA(2),IAD(4,5),XGG,YGG,IAB,TDA,TUB,TDC,IPU   00000060
      COMMON /uCOM/ NuOR,Ix,Iy,TT(16,21),XTC,IXX,IYY,RAD,Z(50,50,3),TD   00000070
      COMMON /ALOM/ PI,SZA(6),ABAR(2),ARUBE(16,2),XS(6)                 00000080
      COMMON /PCOM/ P=(200),PR(200),PB(200,4),PX(200),PY(200),PB(200),  00000090
     *XX(200),uM?(200),uA(16),uB(16),PRUBE(16,2),CV,IPB,RAT,TUA,PBAR(2) 00000100
     *D=0
C       CLEAR AND INITIALIZE                                            00000110
      CALL CLINT                                                        00000120
C                                                                       00000130
C       REAU RECEPTOR COORDINATES                                       00000140
  401 READ(IR,402,END=403)MX,MY,XPX(9),XPX(10),XPOBE                    00000150
C         XX: COORDINATE OF RECEPTOR                                    00000160
C         YY: COORDINATE OF RECEPTOR                                    00000170
C         XPX(9): OBSERVED P 1 CONCENTRATION AT THIS RECEPTOR IF KNOWN  00000180
C         XPX(10): OBSERVED  P 2 CONCENTRATION AT THIS RECEPTOR IF KNOWN 00000190
  402 FORMAT(2F8.2,I4X,I4,3X,I4,I5)                                     00000200
      IF(MULTI) CALL RFREE(MX,MY,F)
C       CONVERT COORDINATES TO EMISSION GRID UNITS                      00000210
      RI=(MX-XO)/RAT+0.5                                                00000220
      RJ=(MY-YO)/RAT+0.5                                                00000230
      IF(XMORE.GE.1) IPG=IPG+6                                          00000240
      IPG=IPG+1                                                         00000250
C       START NEW PAGE IF LINE COUNT OF 58                              00000260
      IF(IPG.LT.59) GOTO499                                             00000270
      IPG=0                                                             00000280
      WRITE(IW,444)IVER,IRUN                                            00000290
  444 FORMAT('1',40X,'CDM VERSION',I6,',  RUN',I6)                      00000300
      WRITE(IW,445)                                                     00000310
  445 FORMAT(' ',40X,'(MICROGRAMS PER CUBIC METER)')                    00000320
      WRITE(IW,410)                                                     00000330
  410 FORMAT(' ',30X,'AREA',15X,'POINT',15X,'TOTAL',13X,'CALIBRATED',   00000340
     *11X,'OBSERVED')                                                   00000350
      WRITE(IW,409)                                                     00000360
  409 FORMAT(' ',5X,'COORDINATES',3X,5(7X,'P 1',6X,' P 2'))             00000370
  499 K=1                                                               00000380
C       K1 PROGRESSES 1 THRU 16 CONTROLLING SECTOR (DIRECTION)          00000390
      DO500I=1,2                                                        00000400
      ABAR(I)=0.                                                        00000410
      PBAR(I)=0.                                                        00000420
      ARDS(I)=0.                                                        00000430
  500 PROS(I)=0.                                                        00000440
      IF(IAD.LT.1) GOTO666                                              00000450
C       DETERMINE MAX. DISTANCE FROM RECEPTOR ACROSS AREA GRID (MX)     00000460
      DX(1)=F(IX=0,5)-RI                                                00000470
      DX(2)=F(IX=0,5)-RI                                                00000480
      DX(3)=DA(2)                                                       00000490
      DX(4)=DX(1)                                                       00000500
      DY(1)=F(IY=0,5)-RJ                                                00000510
      DY(2)=DY(1)                                                       00000520
      DY(3)=F(IY=0,5)-RJ                                                00000530
      DY(4)=DY(3)                                                       00000540
      TXB=(F(I)=0.+DX(1)=DY(1))=0.5                                     00000550
      TXB=X                                                             00000560
      TWB=(DX(2)=DX(2)+DY(1)=DY(1))=0.5                                 00000570
      IF(TW.GT.TX) TXB=TW                                               00000580
      IF(TW.LT.TX) TWB=TW                                               00000590
      TWB=(DX(2)=DX(2)+DY(3)=DY(3))=0.5                                 00000600
      IF(TW.GT.TX) TXB=TW                                               00000610
      IF(TW.LT.TX) TWB=TW                                               00000620
      TWB=(DX(1)=DX(1)+DY(3)=DY(3))=0.5                                 00000630
      IF(TW.GT.TX) TXB=TW                                               00000640
      IF(TW.LT.TX) TWB=TW                                               00000650
      TWB=X=0                                                           00000660
C       TEST IF RECEPTOR WITHIN AREA SOURCE                             00000670
      IF(RI=0.5.LT.IX.OR.RI=0.5.GT.IAA) GOTO6                           00000680
      IF(RJ=0.5.LT.IY.OR.RJ=0.5.GT.IYY) GOTO6                           00000690
      I=61                                                              00000700
      M=1                                                               00000710
      GOTO61                                                            00000720
    6 I=62                                                              00000730
C       DETERMINE MINIMUM DISTANCE FROM RECEPTOR TO AREA SOURCES        00000740
      TMN=TN/2=                                                         00000750
      TK1=0.                                                            00000760
      TN1=4000.                                                         00000770
      DO17I=1,N                                                         00000780
      IF(DX(I)!=5,6,7                                                   00000790
    5 IF(DX(I).EQ.0.) GOTO9                                             00000800
      TA(I)=ATAN(DY(I)/DX(I))=RAD=180.                                  00000810
      GOTO10                                                            00000820
    9 TA(I)=90.                                                         00000830
      GOTO10                                                            00000840
    6 IF(DY(I))10,11,12                                                 00000850
   10 TA(I)=270.                                                        00000860
      GOTO10                                                            00000870
   11 TA(I)=0.                                                          00000880
      GOTO10                                                            00000890
   12 TA(I)=90.                                                         00000900
      GOTO10                                                            00000910
    7 IF(DY(I))13,14,15                                                 00000920
   13 TA(I)=ATAN(DY(I)/DX(I))=RAD+360.                                  00000930
      GOTO10                                                            00000940
   14 TA(I)=360.                                                        00000950
      GOTO10                                                            00000960
   15 TA(I)=ATAN(DY(I)/DX(I))=RAD                                       00000970
   16 IF(TA(I).GT.TK1) TK1=TA(I)                                        00000980
      IF(TA(I).LT.TN1) TN1=TA(I)                                        00000990
   17 CONTINUE                                                          00001000
      TDI=TK1-TN1                                                       00001010
   70 DO94I=1,4                                                         00001020
   94 A(I)=TA(I)                                                        00001030
```

```
      TX=TXI                                                            00001040
      TN=TNI                                                            00001050
      IF(TDIF.GT.180.) GOTO29                                           00001060
      TM=90.-TX(K)                                                      00001070
      IF(TM.LT.0.) TM=TM+360.                                           00001080
   27 IF(TM.GE.TN+11.25) GOTO28                                         00001090
      IF(TM.GE.11.25) GOTO666                                           00001100
      TM=TM+360.                                                        00001110
   28 IF(TM=(TX+11.25))40,40,666                                        00001120
   29 TM=180.-TX(K)                                                     00001130
      IF(TM.LT.0.) TM=TM+360.                                           00001140
   30 TX=0.                                                             00001150
      TN=400.                                                           00001160
      DO36I=1,4                                                         00001170
      A(I)=BA(I)+90.                                                    00001180
      IF(A(I).GE.360.) A(I)=BA(I)-360.                                  00001190
      IF(A(I).GT.TN) TX=BA(I)                                           00001200
      IF(A(I).LT.TN) TN=BA(I)                                           00001210
   36 CONTINUE                                                          00001220
      IF(TX-TN.LE.180.) GOTO27                                          00001230
      TM=270.-TX(K)                                                     00001240
      IF(TM.LT.0.) TM=TM+360.                                           00001250
      GOTO30                                                            00001260
   40 DIF=(TX-TN)/(2.*RAD)                                              00001270
      MM=TMM*COS(DIF)                                                   00001280
C        NEGATE POSSIBLE ERROR IN COSINE FUNCTION.                      00001290
      L=MCO(MM,INC(4))                                                  00001300
      IF(L.LF.0) L=INC(4)                                               00001310
      MM=MM*L                                                           00001320
C        MM ALWAYS EQUALS 1 IF RECEPTOR WITHIN AREA SOURCE GRID         00001330
      IF(MM.LT.1) MM=1                                                  00001340
   41 NMM                                                               00001350
      CALL CALG                                                         00001360
      CALL AREA                                                         00001370
C        IF NO POINT SOURCES, GO TO NEXT SECTOR                         00001380
  666 IF(IPS.LE.0) GOTO408                                              00001390
      CALL POINT                                                        00001400
  408 IF(N.LF.16) GOTO452                                               00001410
      NN=1                                                              00001420
C        K LOOPS THRU 16 SECTORS                                        00001430
      DO503I=1,2                                                        00001440
      AROSE(K,I)=0.                                                     00001450
  503 PROSE(K,I)=0.                                                     00001460
C        IF NO AREA SOURCES, CHECK POINT SOURCES                        00001470
      IF(IAS.LT.1) GOTO66A                                              00001480
C        BRANCH TO 61 OR 70 DEPENDS ON WHETHER RECEPTOR IS INSIDE AREA  00001490
      GOTO(61,70),IM                                                    00001500
C          PRINT AND PUNCH OUTPUT                                       00001510
  452 DO505I=1,2                                                        00001520
      TCON(I)=PBAR(I)+ABAR(I)                                           00001530
  505 CCON(I)=CA(I)+CB(I)+TCON(I)                                       00001540
C          TCON: TOTAL CONCENTRATION                                    00001550
C          CCON: CALIBRATED CONCENTRATION                               00001560
      WRITE(IWR,412)QS,XX,ABAR,PBAR,TCON,CCON,XPX(9),XPX(10)            00001570
  412 FORMAT(' ',F9.2,F10.2,2F10.0,2I10)                                00001580


C          ABARI CONTRIBUTION FROM AREA SOURCES                         00001590
C          PBARI CONTRIBUTION FROM POINT SOURCES                        00001600
      PUX=(RX-XGG)/RATG+1.                                              00001610
C          PUXI X COORDINATE OF PLOTTING GRID                           00001620
      PUY=(RY-YGG)/RATG+1.                                              00001630
C          PUYI Y COORDINATE OF PLOTTING GRID                           00001640
C          XPXI CARD OUTPUT VECTOR                                      00001650
      XPX(1)=ABAR(1)+0.5                                                00001660
      XPX(2)=ABAR(2)+0.5                                                00001670
      XPX(3)=PBAR(1)+0.5                                                00001680
      XPX(4)=PBAR(2)+0.5                                                00001690
      XPX(5)=TCON(1)+0.5                                                00001700
      XPX(6)=TCON(2)+0.5                                                00001710
      XPX(7)=CCON(1)+0.5                                                00001720
      XPX(8)=CCON(2)+0.5                                                00001730
      WRITE(IPU,405)PUX,PUY,(XPX(L),L=1,10),RX,RY,IMUN                  00001740
  405 FORMAT(F8.2,F6.2,10I4,2F10.2,I5,'I')                              00001750
      IF(NROSE.LT.1) GOTO401                                            00001760
      XPX(17)=RX*100.                                                   00001770
      XPX(18)=RY*100.                                                   00001780
      WRITE(IWR,461)                                                    00001790
  461 FORMAT(' AREA  ROSES')                                            00001800
      DO463J=1,2                                                        00001810
      DO462I=1,16                                                       00001820
  462 XPX(I)=AROSE(I,J)+0.5                                             00001830
      WRITE(IWR,467)ROSE(J),XPX                                         00001840
  467 FORMAT(' ',A4,4X,16I4)                                            00001850
  463 WRITE(IPU,464)ROSE(J),XPX                                         00001860
      WRITE(IWR,468)                                                    00001870
  468 FORMAT(' POINT ROSES')                                            00001880
      DO466L=1,2                                                        00001890
      DO465K=1,16                                                       00001900
  465 XPX(K)=PROSE(K,L)+0.5                                             00001910
      WRITE(IWR,467)PROSE(L),XPX                                        00001920
  466 CONTINUE                                                          00001930
  464 FORMAT(A4,16I4,2I6)                                               00001940
      GOTO401                                                           00001950
  403 RETURN                                                            00001960
      END                                                               00001970
```

```
      SUBROUTINE CALQ                                                   00001980
      DIMENSION C(3)                                                    00001990
      COMMON /C1/ X,MX,MN,MT,P(6,6,10),G(6,5),U(6),RI,RJ,INC(4),DELR    00002000
      COMMON /C2/ UE(6),VD,YN,YMN,MMIN,DINT,YCON,TA(4),IPG,XG,YG,IRD    00002010
      COMMON /C3/ MATG,IRUN,CA(2),CB(2),TX(16),AROS(2),PROB(2),TANG     00002020
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),GB(2),NG,IVER,IWR   00002030
      COMMON /C5/ Q(100,4),GA(2),IAD(4,5),XGG,YGG,IAB,TDA,TDB,TDC,IPU   00002040
      COMMON /QCOM/ N,DR,IX,IY,TT(16,21),KTC,IXX,IYY,RAD,Z(50,50,3),TD   00002050
C        CALCULATE SECTOR AREA SOURCE VECTOR G(NG,I)                    00002060
C             N = INDEX OF RADIAL ARC                                   00002070
C             I = 1; P 1 EMISSION RATE                                  00002080
C             I = 2;  P 2 EMISSION RATE                                 00002090
C             I = 3; AREA STACK HEIGHT                                  00002100
      NG=0                                                              00002110
  700 NG=NG+1                                                           00002120
      DO701I=1,3                                                        00002130
  701 G(NG,I)=0.                                                        00002140
      G(NG,4)=(N-1)*DELR                                                00002150
      RB=(N-1)*DR                                                       00002160
C        RI RADIAL UPWIND DISTANCE                                      00002170
      KT=(N-1)*DELR/2500.+1.                                            00002180
C        KT1 CONTROLS INCREMENT TO NEXT ARC                             00002190
      IF(KT.GT.6) KT=6                                                  00002200
C        KTC1 CONTROLS NUMBER OF POINTS ALONG ARC (DINT+1)              00002210
      MN=0.                                                             00002220
      DO90LL=1,KTC                                                      00002230
C        DETERMINE WHICH AREA SOURCE THE POINT FALLS ON.  IF ON THE LINE00002240
C             TWO ARE AVERAGED.  IF ON AN INTERSECTION, FOUR ARE AVERAGED 00002250
      T=TT(K,LL)                                                        00002260
      TI=RI+R*COS(T)                                                    00002270
      TJ=RJ+R*SIN(T)                                                    00002280
      IF(TI.LT.YDA.OR.TI.GT.TDB) GOTO90                                 00002290
      IF(TJ.LT.YDA.OR.TJ.GT.TDC) GOTO90                                 00002300
      I=TI                                                              00002310
      J=TJ                                                              00002320
      IF(I.LT.1) I=1                                                    00002330
      IF(J.LT.1) J=1                                                    00002340
      D=TI-I                                                            00002350
      IF(ABS(D-0.5).LE.TD) GOTO78                                       00002360
      IF(D-0.5)82,76,86                                                 00002370
   76 D=TJ-J                                                            00002380
      IF(ABS(D-0.5).LE.TD) GOTO79                                       00002390
      IF(D-0.5)80,79,81                                                 00002400
   79 IA=1                                                              00002410
      JA=5                                                              00002420
      GOTO101                                                           00002430
   80 IA=2                                                              00002440
      JA=3                                                              00002450
      GOTO101                                                           00002460
   81 IA=2                                                              00002470
      JA=4                                                              00002480
      GOTO101                                                           00002490
   82 D=TJ-J                                                            00002500
      IF(ABS(D-0.5).LE.TD) GOTO83                                       00002510
      IF(D-0.5)84,83,85                                                 00002520

   83 IA=3                                                              00002530
      JA=2                                                              00002540
      GOTO101                                                           00002550
   84 IA=3                                                              00002560
      JA=3                                                              00002570
      GOTO101                                                           00002580
   85 IA=3                                                              00002590
      JA=4                                                              00002600
      GOTO101                                                           00002610
   86 D=TJ-J                                                            00002620
      IF(ABS(D-0.5).LE.TD) GOTO87                                       00002630
      IF(D-0.5)88,87,89                                                 00002640
   87 IA=4                                                              00002650
      JA=2                                                              00002660
      GOTO101                                                           00002670
   88 IA=4                                                              00002680
      JA=3                                                              00002690
      GOTO101                                                           00002700
   89 IA=4                                                              00002710
      JA=4                                                              00002720
  101 C=0.                                                              00002730
      IF(I.EQ.IXX) IA=3                                                 00002740
      IF(J.EQ.IYY) JA=3                                                 00002750
      DO80LC=1,3                                                        00002760
  80A C(L)=0.                                                           00002770
      DO802IR=1,4                                                       00002780
      IV=I+IAD(IR,IA)                                                   00002790
      JV=J+IAD(IR,JA)                                                   00002800
      DO801L=1,2                                                        00002810
  801 C(L)=C(L)+Z(IV,JV,L)                                              00002820
      IF(Z(IV,JV,3).LE.0.1) GOTO802                                     00002830
      CN=CN+1.                                                          00002840
      C(3)=C(3)+Z(IV,JV,3)                                              00002850
  802 CONTINUE                                                          00002860
      C(1)=C(1)/4.                                                      00002870
      C(2)=C(2)/4.                                                      00002880
      IF(CN.GT.0.5) GOTO803                                             00002890
      C(3)=1.                                                           00002900
      GOTO804                                                           00002910
  803 C(3)=C(3)/CN                                                      00002920
  804 IF(R.GT.0.) GOTO103                                               00002930
      DO201LA=1,3                                                       00002940
  201 G(NG,LA)=C(LA)                                                    00002950
      GOTO102                                                           00002960
  103 IF(LL.NE.1.AND.LL.NE.KTC) GOTO104                                 00002970
C        TRAPEZOIDAL INTEGRATION APPLIED                                00002980
      DO203LB=1,2                                                       00002990
  203 C(LB)=C(LB)*0.5                                                   00003000
  104 DO204LC=1,2                                                       00003010
  204 G(NG,LC)=G(NG,LC)+C(LC)                                           00003020
      IF(C(1)+C(2).LE.0.) GOTO90                                        00003030
      G(NG,3)=G(NG,3)+C(3)                                              00003040
   99 MN=MN+1.                                                          00003050
   90 CONTINUE                                                          00003060
      DO202LD=1,2                                                       00003070
```

```
  202 Q(NQ,LD)=Q(NQ,LD)/DINT                                          00003080
      IF(HN.GT.0.5) GOTO105                                           00003090
      Q(NQ,3)=I.                                                      00003100
      GOTO102                                                         00003110
  105 Q(NQ,3)=Q(NQ,3)/HN                                              00003120
  102 N=N+INC(NI)                                                     00003130
      IF(N.LE.MX+1) GOTO700                                           00003140
C        IF NEXT ARC IS BEYOND AREA GRID, RETURN                      00003150
      Q(NQ+1,4)=(N-1)*DELR                                            00003160
      RETURN                                                          00003170
      END                                                             00003180


      SUBROUTINE AREA                                                 00003190
      DIMENSION C(2)                                                  00003200
      COMMON /C1/ K,MX,MN,MT,F(6,6,16),G(6,5),U(6),RI,RJ,INC(4),DELR  00003210
      COMMON /C2/ UF(6),YD,YN,YMN,HMIN,DINT,YCON,TA(4),IPG,XG,YG,IRD  00003220
      COMMON /C3/ RATG,IRUN,CA(2),CB(2),TK(16),AROB(2),PROB(2),YANG   00003230
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),GB(2),NQ,IVER,INR 00003240
      COMMON /C5/ Q(100,4),QA(2),IAD(4,5),XGG,YGG,IAS,TDA,TDB,TDC,IPU 00003250
      COMMON /ACOM/ PI,SZA(6),ABAR(2),AROBE(16,2),XB(6)               00003260
      Y=Y0                                                            00003270
C        CALCULATE SECTOR CONCENTRATION FROM AREA SOURCE VECTOR (Q)    00003280
      DO338IS=1,6                                                     00003290
C           IS1 CONTROLS STABILITY CLASS                             00003300
      IF(IS.EQ.5) Y=YN                                                00003310
      IC=ICA(IS)                                                      00003320
      DO338IU=1,6                                                     00003330
C           IU1 CONTOLS WIND SPEED CLASS                             00003340
C           IF FREQUENCY IS ZERO, SKIP                               00003350
      IF(F(IS,IU,K).LE.0.) GOTO338                                    00003360
      C(1)=0.                                                         00003370
      C(2)=0.                                                         00003380
      IR=1                                                            00003390
      DVLRI=Q(2,4)-Q(1,4)                                             00003400
  701 R=Q(IR,4)                                                       00003410
      DVLR=DVLRI                                                      00003420
      DVLRI=Q(IR+1,4)-R                                               00003430
      WZ=(Q(IR,3)+0.1)**UF(IS)                                        00003440
      W3=U(IU)*WZ                                                     00003450
      DO801JA=1,2                                                     00003460
      DF=W3*GA(JA)                                                    00003470
  801 DECAY(JA)=EXP(R/DF)                                             00003480
      RX3=R*X3(IS)                                                    00003490
      IF(RX3-5000.)311,313,310                                        00003500
  310 IZ=1                                                            00003510
      GOTO327                                                         00003520
  311 IF(RX3.GE.500.) GOTO313                                         00003530
      IZ=3                                                            00003540
      GOTO327                                                         00003550
  313 IZ=2                                                            00003560
  327 SZ=G(IZ,IC)*RX3**G(IZ+5,IC)                                     00003570
      IF(SZ.LE.0.) GOTO346                                            00003580
      IF(SZ.GE.MX(IS)) GOTO317                                        00003590
      STK2=Q(IR,3)*Q(IR,3)                                            00003600
      SBB=0.5*STK2/(SZ+STK2)                                          00003610
      S=PI*(X3(IS)/SZ)**2*SBB                                         00003620
      GOTO319                                                         00003630
  317 S=1./(X3*MX(IS))                                                00003640
C        LID HAS BEEN REACHED                                         00003650
      IRI=IR                                                          00003660
  702 R=Q(IRI,4)                                                      00003670
      DVLR=DVLRI                                                      00003680
      DVLRI=Q(IRI+1,4)-R                                              00003690
      WZ=(Q(IRI,3)+0.1)**UF(IS)                                       00003700
      W3=U(IU)*WZ                                                     00003710
      DO802JB=1,2                                                     00003720
      DF=W3*GA(JB)                                                    00003730


  802 DECAY(JB)=EXP(R/DF)                                             00003740
      IF(IRI.EQ.1.OR.IRI.EQ.NQ) GOTO320                               00003750
      DO465JC=1,2                                                     00003760
  465 C(JC)=C(JC)+(Q(IRI,JC)*S*(DVLR*DVLRI))/DECAY(JC)                00003770
      GOTO366                                                         00003780
C        TRAPEZOIDAL INTEGRATION APPLIED                              00003790
  320 DO445JF=1,2                                                     00003800
  445 C(JF)=C(JF)+(Q(IRI,JF)*S*DVLR)/DECAY(JF)                        00003810
  366 IRT=IRT+1                                                       00003820
C        LOOPS TO RMD(MAX)                                            00003830
      IF(IRT.LE.NQ) GOTO702                                           00003840
      GOTO347                                                         00003850
  319 IF(IR.EQ.1.OR.IR.EQ.NQ) GOTO323                                 00003860
C        LID HAS NOT BEEN REACHED                                     00003870
C        TRAPEZOIDAL INTEGRATION APPLIED                              00003880
      DO462JI=1,2                                                     00003890
  462 C(JI)=C(JI)+(Q(IR,JI)*S*(DVLR*DVLRI))/DECAY(JI)                 00003900
      GOTO346                                                         00003910
C        TRAPEZOIDAL INTEGRATION APPLIED                              00003920
  323 DO423JK=1,2                                                     00003930
  423 C(JK)=C(JK)+(Q(IR,JK)*S*DVLR)/DECAY(JK)                         00003940
  346 IR=IR+1                                                         00003950
C        LOOPS TO RMD(MAX)                                            00003960
      IF(IR.LE.NQ) GOTO701                                            00003970
  347 X=Y*YCON*F(IS,IU,K)                                             00003980
      DO447JL=1,2                                                     00003990
      AROBE(K,JL)=AROBE(K,JL)+C(JL)*X                                 00004000
  447 ABAR(JL)=ABAR(JL)+C(JL)*X                                       00004010
  338 CONTINUE                                                        00004020
      RETURN                                                          00004030
      END                                                             00004040
```

```
      SUBROUTINE POINT                                                  00004050
      DIMENSION S(2)                                                    00004060
      COMMON /C1/ A,MX,MN,MT,F(6,6,16),G(6,5),U(6),RI,RJ,INC(4),DELR    00004070
      COMMON /C2/ UE(6),TD,YN,THN,HMIN,DINT,YCON,TA(6),IPG,XG,YG,IRD    00004080
      COMMON /C3/ WATG,IRUN,CA(2),CB(2),TK(16),AROB(2),PROB(2),TANG     00004090
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),SB(2),ND,IVER,IWR   00004100
      COMMON /C5/ Q(100,4),QA(2),IAD(4,5),XGG,YGG,IAS,TDA,TDB,TDC,IPU   00004110
     *XX(200),DMF(200),WA(16),WB(16),PROBE(16,2),CV,IPS,WAT,TUA,PBAR(2) 00004120
C        CALCULATE SECTOR CONCENTRATION FROM POINT SOURCES               00004130
C        IP LOOPS TO IPS (NUMBER OF POINT SOURCES)                       00004140
      IP=1                                                              00004150
C           FINDS UP=IND (XP) AND CROSS=IND (YP) DISTANCES FROM RECEPTOR 00004160
C              TO SOURCE                                                00004170
  667 VXX=PX(IP)-RI                                                     00004180
      VY=PY(IP)-RJ                                                      00004190
      XP=(VY*WA(K)+VX*WB(K))*RAT*CV                                     00004200
      IF(XP.LE.0.) GOTO659                                              00004210
      YP=ABS((VY*=B(K)-VX*WA(K))*RAT*CV)                                00004220
      TMP=XP*0.19891                                                    00004230
C           IF SOURCE MAKES NO CONTRIBUTION TO RECEPTOR, SKIP TO NEXT   00004240
      IF(YP.GT.TM) GOTO659                                              00004250
      IF(PM(IP).GE.50.) GOTO654                                         00004260
      SZI=50.-PM(IP)                                                    00004270
      IF(SZI.GT.30.) SZI=30.                                            00004280
      GOTO635                                                           00004290
  654 SZI=0.                                                            00004300
  635 YSYD                                                              00004310
      DO7771S=1,6                                                       00004320
C           IS= CONTROLS STABILITY CLASS                                00004330
      IF(IS.EQ.5) YSYN                                                  00004340
      IC=ICP(IS)                                                        00004350
      =Z=(PM(IP)+0.1)**UE(IS)                                           00004360
      IF(SZI.LE.0.) GOTO650                                             00004370
      XS=(SZI/G(1,IC))**(1./G(4,IC))                                    00004380
      IF(XS.GE.5000.) GOTO624                                           00004390
      XS=(SZI/G(2,IC))**(1./G(5,IC))                                    00004400
      IF(XS.GE.500.) GOTO624                                            00004410
      XS=(SZI/G(3,IC))**(1./G(6,IC))                                    00004420
      GOTO624                                                           00004430
  650 XS=0.                                                             00004440
  624 DIST=XP+XS                                                        00004450
      IF(DIST-5000.)641,643,640                                         00004460
  640 IZ=1                                                              00004470
      GOTO644                                                           00004480
  641 IF(DIST.GE.500.) GOTO643                                          00004490
      IZ=3                                                              00004500
      GOTO644                                                           00004510
  643 IZ=2                                                              00004520
  644 SZ=G(IZ,IC)*DIST**G(IZ+3,IC)                                      00004530
      IF(SZ.LE.0.) GOTO777                                              00004540
      DO658IU=1,6                                                       00004550
C           IU= CONTROLS WIND SPEED CLASS                               00004560
C           IF FREQUENCY IS ZERO, SKIP                                  00004570
      IA(F(IS,IU,K).LE.0.) GOTO658                                      00004580
                                                                        00004590
      =S=/(IU)*=Z                                                       00004600
      DO744JA=1,2                                                       00004610
      DF=-S*GA(JA)                                                      00004620
  744 DECAY(JA)=EXP(XP/DF)                                              00004630
      IF(PM(IP).LE.0.) GOTO637                                          00004640
C              HOLLANDS EQN.                                            00004650
      U=XP*(IP)/=S                                                      00004660
      UM=U=*(1.4=0.1*IL)                                                00004670
      GOTO638                                                           00004680
C              BRIGGS PLUME RISE  (1970)                                00004690
  637 XSI=XP/XX(IP)                                                     00004700
      IF(XSI.GT.3.5) GOTO608                                            00004710
      DH=FB(IP)/=S**0.6667                                              00004720
      GOTO638                                                           00004730
  608 D=DMF(IP)/=S                                                      00004740
  638 PHDH=PM(IP)+DH                                                    00004750
      IF(PHDH.GT.M(IS)) GOTO658                                         00004760
      PHDH=PHDH+PHDH                                                    00004770
      IF(SZ.GE.MX(IS)) GOTO614                                          00004780
      BB=0.5*(PHDH/(SZ+SZ))                                             00004790
      IF(ABS(BB).GT.60.) GOTO658                                        00004800
      ==*=S*XP*SZ                                                       00004810
      S(1)=PS(IP,1)/==                                                  00004820
      S(2)=PS(IP,2)/==                                                  00004830
      ==*EXP(BB)                                                        00004840
      S(1)=S(1)*==                                                      00004850
      S(2)=S(2)*==                                                      00004860
      GOTO615                                                           00004870
  614 ==*=S*EXP(=(IS)                                                   00004880
      S(1)=PS(IP,3)/==                                                  00004890
      S(2)=PS(IP,4)/==                                                  00004900
  615 BB=YCON*F(IS,IU,K)                                                00004910
      DO715JB=1,2                                                       00004920
      XS=(JB)=BB/DECAY(JB)                                              00004930
      PWGSF(K,JB)=PROBE(K,JB)*X                                         00004940
  715 PBAR(JB)=PBAR(JB)+X                                               00004950
  658 CONTINUE                                                          00004960
  777 CONTINUE                                                          00004965
  659 IP=IP+1                                                           00004970
      IF(IP.LE.IPS) GOTO667                                             00004980
C        LOOPS UNTIL ALL POINT SOURCES EVALUATED                        00004990
      RETURN                                                            00005000
      END                                                               00005010
```

```
      BLOCK DATA                                                        00007730
      COMMON /C1/ R,HI,HN,HT,F(6,6,16),G(6,5),U(6),HI,HJ,INC(4),DELR    00007740
      COMMON /C2/ UB(6),YD,YN,T4N,HMIN,DINT,YCON,TA(4),IPG,XG,YG,IRD    00007750
      COMMON /C3/ RATG,IRUN,CA(2),CB(2),TK(16),ARQS(2),PROS(2),TANG     00007760
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),GB(2),NG,IVER,IWR   00007770
      COMMON /C5/ G(100,4),GA(2),IAD(4,5),XGG,YGG,IAB,TDA,TUB,TDC,IPU   00007780
      COMMON /QCOM/ N,DR,IX,IY,TT(16,21),KTC,IXX,IYY,RAD,Z(50,50,3),TD  00007790
      COMMON /ACOM/ PI,BZA(6),AHAH(2),AMOSE(16,2),XB(6)                 00007800
      COMMON /PCOM/ PM(200),PR(200),PB(200,4),PX(200),PY(200),PB(200),  00007810
     *XX(200),UMP(200),MA(16),MM(16),PMOSE(16,2),CV,IPB,RAT,TUA,PMAR(2) 00007820
      DATA G/2*2,5398-4,,0381,2*2,0886,1,2812,2*,0496U,,1393,2*1,1137,  00007830
     *,9467,,1154,,1014,,112,,9109,,926,,91,,7368,,2591,,0856,,5642,    00007840
     *,6869,,865,1,2969,,2527,,0818,,4421,,6341,,8155/                  00007850
      DATA TANG,U/78,75,1,5,2,45872,4,4704,6,92912,9,61136,12,51712/    00007860
      DATA YCON,UB/0,187,0,1,0,15,0,2,0,25,0,25,0,3/                    00007870
      DATA INC,IPG,IPB,IX,IY/1,2,4,4,70,0,1,1/                          00007880
      DATA IXX,IYY,IAB/1,1,0/, TD/0,1E-5/                               00007890
      DATA RAD,PI/57,2958,3,141593/                                     00007900
      DATA IAD/0,0,1,1,0,1,0,1,4*0,4*1,0,1,1,0/                         00007910
      DATA ICA,ICP/1,1,2,3,4,4,1,2,3,3*4/                               00007920
      DATA IVER/75104/                                                  00007930
      END                                                               00007940
```

```
      SUBROUTINE CLIAT                                                  00005020
      COMMON /C1/ R,HI,HN,HT,F(6,6,16),G(6,5),U(6),HI,HJ,INC(4),DELR    00005030
      COMMON /C2/ UB(6),YD,YN,T4N,HMIN,DINT,YCON,TA(4),IPG,XG,YG,IRD    00005040
      COMMON /C3/ RATG,IRUN,CA(2),CB(2),TK(16),ARQS(2),PROS(2),TANG     00005050
      COMMON /C4/ DECAY(2),ICA(6),ICP(6),M(6),MX(6),GB(2),NG,IVER,IWR   00005060
      COMMON /C5/ G(100,4),GA(2),IAD(4,5),XGG,YGG,IAB,TDA,TDB,TDC,IPU   00005070
      COMMON /QCOM/ N,DR,IX,IY,TT(16,21),KTC,IXX,IYY,RAD,Z(50,50,3),TD  00005080
      COMMON /ACOM/ PI,BZA(6),AHAH(2),AMOSE(16,2),XB(6)                 00005090
      COMMON /PCOM/ PM(200),PR(200),PB(200,4),PX(200),PY(200),PB(200),  00005100
     *XX(200),UMP(200),MA(16),MM(16),PMOSE(16,2),CV,IPB,RAT,TUA,PMAR(2) 00005110
C        SUBROUTINE CLEARS AND INITIALIZES,                             00005120
      DO333I=1,50                                                       00005130
      DO333J=1,50                                                       00005140
C        EFFECTIVE STACK HEIGHT MUST BE GE 1,                           00005150
      Z(I,J,3)=1,                                                       00005160
      DO333K=1,2                                                        00005170
  333 Z(I,J,K)=0,                                                       00005180
C        U(N)= CENTER SPEED OF SIX WIND SPEED CLASSES                   00005190
      TK(1)=0,                                                          00005200
      DO344I=2,16                                                       00005210
  344 TK(I)=TK(I-1)+22,5                                                00005220
C        UE(N)= EXPONENTIAL OF WIND PROFILE.  0,001 = NO PROFILE,       00005230
C           N = STABILITY CLASS                                         00005240
      READ(5,5451ARQS,PROS,IRUN,NLIST,CA,CB                             00005250
C        ARQS,PROS= OUTPUT CARD IDENTIFIERS                             00005260
C        IRUN= IDENTIFICATION NUMBER                                    00005270
C        NLIST= INPUT LIST OPTION,  NLIST LE ZERO PRODUCES LIST         00005280
C        CA,CB= INTERCEPT, SLOPE OF CALIBRATION                         00005290
  545 FORMAT(4A4,2I5,15X,4F9,0)                                         00005300
C        INPUT MODEL PARAMETERS                                         00005310
      READ(5,504)DELR,RAT,CV,HT,HMIN,XG,YG,XGG,YGG,RATG,TDA,TXX         00005320
C        DELR= INTEGRATION INCREMENT (RADIAL DISTANCE (M))              00005330
C        RAT= RATIO, EMISSION GRID TO MAP GRID                          00005340
C        HT= AVERAGE AFTERNOON MIXING HEIGHT (M)                        00005350
C        CV= CONVERSION, CV=PAT @ EMISSION GRID INTERVAL (P)            00005360
C        HMIN= NOCTURNAL MIXING HEIGHT (M)                              00005370
C        XG= MAP COORDINATE X, SOUTHWEST CORNER OF EMISSION GRID        00005380
C        YG= MAP COORDINATE Y, SOUTHWEST CORNER OF EMISSION GRID        00005400
C        XGG= MAP COORDINATE X, SOUTHWEST CORNER OF PLOTTING GRID       00005420
C        YGG= MAP COORDINATE Y, SOUTHWEST CORNER OF PLOTTING GRID       00005440
C        RATG= RATIO, EMISSION GRID TO MAP GRID                         00005460
C        TDA= MEAN AMBIENT TEMPERATURE (C)                              00005470
C        TXX= WIDTH OF A BASIC AREA SOURCE SQUARE (M)                   00005480
  504 FORMAT(12F6,0)                                                    00005520
      READ(5,504)DINT,YD,YN,BZA,GB                                      00005530
C        DINT= NUMBER OF SPOKEPATS DESIRED IN 22,5 DEG, SECTORS,.       00005540
C           RANGE 2 TO 20 INCLUSIVE,                                    00005550
C        YD= RATIO, AVG, DAYTIME EMISSION / 24-HR EMISSION              00005560
C        YN= RATIO, AVG, NIGHTTIME EMISSION / 24-HR EMISSION            00005570
C        BZA(N)= INITIAL SIGMA Z FOR AREA SOURCES (M)                   00005580
C           N = STABILITY CLASS                                         00005590
C        GB(N)= DECAY RATE HALF LIFE                                    00005600
C           N=1  P 1,  N=2  P 2                                         00005610
      TOAMTCA=273,16                                                    00005710
      DR=DELR/(CV*RAT)                                                  00005720
```

```
      ATC=DINT+1,
      THETA=22,5/DINT                                                   00005730
      DO519I=1,16                                                       00005740
      B=TH(I)/RAD                                                       00005750
      =B(I)=SIN(B)                                                      00005760
      WA(I)=COS(B)                                                      00005770
      DO519J=1,ATC                                                      00005780
      XBTANG=TA(I)+(J-1)*THETA                                          00005790
      IF(X,LT,0,) X=X+360,                                              00005800
  519 TT(I,J)=X/RAD                                                     00005810
C         DEFINE HALF LIFE FOR P 1 AND  P 2                           00005820
      GA(1)=GB(1)*3600,/0,693                                           00005830
      GA(2)=GB(2)*3600,/0,693                                           00005840
      M(1)=MT+1,5                                                       00005850
      M(2)=MT                                                           00005860
      M(3)=MT                                                           00005870
      M(4)=MT                                                           00005880
      M(5)=(MT+MIN)*0,5                                                 00005890
      M(6)=MMIN                                                         00005900
      DO114JA=1,6                                                       00005910
      JB=ICA(JA)                                                        00005920
      MX(JA)=0,0=(JA)                                                   00005930
      SA=SZA(JA)                                                        00005940
      IF(SA,GT,0,) GOTO110                                              00005950
      S=0,                                                              00005960
      GOTO114                                                           00005970
  110 S=(SA/G(1,JB))**(1,/G(4,JB))                                      00005980
      IF(S,GE,5000,) GOTO114                                            00005990
      S=(SA/G(2,JB))**(1,/G(5,JB))                                      00006000
      IF(S,GE,500,) GOTO114                                             00006010
      S=(SA/G(3,JB))**(1,/G(6,JB))                                      00006020
  114 XS(JA)=S                                                          00006030
      IF(NLIST,GT,0) GOTO501                                            00006040
      WRITE(IW,800)IVER,IRUN                                            00006050
  800 FORMAT('1',40X,'CDM VERSION',I6,',  RUN',I6)                      00006060
      WRITE(IW,801)                                                     00006070
  801 FORMAT('0THE CENTRAL WIND SPEEDS OF THE SIX WIND SPEED CLASSES (U)00006080
     *:')                                                               00006090
      WRITE(IW,802)U                                                    00006100
  802 FORMAT(' ',6E20,6)                                                00006110
      WRITE(IW,803)                                                     00006120
  803 FORMAT('0THE EXPONENTIAL OF THE VERTICAL WIND PROFILE BY STABILITY00006130
     * CLASS (UE)')                                                     00006140
      WRITE(IW,802)UE                                                   00006150
      WRITE(IW,804)                                                     00006160
  804 FORMAT('0THE INITIAL SIGMA Z FOR AREA SOURCES BY STABILITY CLASS (00006170
     *SZA)')                                                           00006180
      WRITE(IW,802)SZA                                                  00006190
      WRITE(IW,805)                                                     00006200
  805 FORMAT('0THE CLIMATOLOGICAL MEAN NOCTURNAL AND AFTERNOON MIXING HE00006210
     *IGHTS (MMIN,MT):')                                               00006220
      WRITE(IW,802)MMIN,MT                                              00006230
      WRITE(IW,806)                                                     00006240
  806 FORMAT('0THE DAY AND NIGHT EMISSION WEIGHT FACTORS (YD,YN):')     00006250
      WRITE(IW,802)YD,YN                                                00006260
                                                                        00006270

      WRITE(IW,807)                                                     00006280
  807 FORMAT('0THE X=MIN AND Y=MIN OF THE AREA EMISSION INVENTORY GRID (00006290
     *XG,YG):')                                                        00006300
      WRITE(IW,802)XG,YG                                                00006310
      WRITE(IW,808)                                                     00006320
  808 FORMAT('0THE WIDTH OF A BASIC AREA SOURCE SQUARE (TXX):')         00006330
      WRITE(IW,802)TXX                                                  00006340
      WRITE(IW,809)                                                     00006350
  809 FORMAT('0THE NUMBER OF SUB-SECTORS CONSIDERED IN A 22,5 DEGREE SEC00006360
     *TOR, AND ANGULAR WIDTH OF A SUB-SECTOR (DINT,THETA):')            00006370
      WRITE(IW,802)DINT,THETA                                           00006380
      WRITE(IW,810)                                                     00006390
  810 FORMAT('0THE INITIAL RADIAL INCREMENT (DELR):')                   00006400
      WRITE(IW,802)DELR                                                 00006410
      WRITE(IW,813)                                                     00006420
  813 FORMAT('0THE RADIAL INCREMENT FACTORS (INC):')                    00006430
      WRITE(IW,814)INC                                                  00006440
  814 FORMAT(' ',4I20)                                                  00006450
      WRITE(IW,811)                                                     00006460
  811 FORMAT('0THE RATIO OF EMISSION GRID TO MAP GRID (RAT):')          00006470
      WRITE(IW,802)RAT                                                  00006480
      WRITE(IW,812)                                                     00006490
  812 FORMAT('0THE GRID CONVERSION FACTOR (CV):')                       00006500
      WRITE(IW,802)CV                                                   00006510
      WRITE(IW,815)                                                     00006520
  815 FORMAT('0THE AMBIENT AIR TEMPERATURE (TDA):')                     00006530
      WRITE(IW,802)TDA                                                  00006540
      WRITE(IW,816)                                                     00006550
  816 FORMAT('0THE DECAY RATE HALF LIFE FOR P 1 AND P 2 (GB):')         00006560
      WRITE(IW,802)GB                                                   00006570
      WRITE(IW,817)                                                     00006580
  817 FORMAT('0THE SIGMA Z COEFFICIENT TABLE (G):')                     00006590
      WRITE(IW,802)G                                                    00006600
C       INPUT SOURCE DATA                                               00006760
  501 READ(IND,502)X,Y,TX,S1,S2,SH,D,VS,T,SA                            00006770
C       X1 COORDINATE (SW CORNER OF GRID CELL IF AREA SOURCE)           00006780
C       Y1 COORDINATE (SW CORNER OF GRID CELL IF AREA SOURCE)           00006790
C       SH1 STACK HEIGHT (M)  POINT SOURCE ONLY                         00006800
C       S1= SOURCE EMISSION RATE (P 1 IN GRAMS/SECOND)                  00006810
C       S2= SOURCE EMISSION RATE ( P 2 IN GRAMS/SECOND)                 00006820
C       SA= FOR POINT SOURCES, IF BLANK, BRIGGS FORMULA USED, IF NOT    00006830
C          BLANK, SH=WIND SPEED IS USED.                                00006840
C       TX1  WIDTH OF THIS CELL (M), MUST BE ZERO ON POINT SOURCE       00006850
C       D1 STACK DIAMETER (M)                                           00006860
C       T1 STACK GAS TEMPERATURE (C)                                    00006870
C       VS1 STACK GAS EXIT VELOCITY (M/S)                               00006880
  502 FORMAT(F6,0,2F7,0,2F8,0,F7,0,F5,0,2F7,0,F5,0)                     00006890
C       TEST END OF SOURCE DATA (BLANK CARD)                            00006900
      IF(S1+S2,LE,0,) GOTO900                                           00006910
      IF(NLIST,GT,0) GOTO888                                            00006920
      IF(IPG,LT,50) GOTO899                                             00006930
      IPG=0                                                             00006940
      WRITE(IW,800)IVER,IRUN                                            00006950
      WRITE(IW,826)                                                     00006960
  826 FORMAT(' SOURCE INPUT')                                           00006970
```

```
      WRITE(IWR,822)                                                    00006980
  822 FORMAT(' ',5X,'X',12X,'Y',11X,'Z',11X,'S1',11X,'S2',11X,'SM',     00006990
     *12X,'D',11X,'VS',12X,'T',11X,'SA')                                00007000
  899 IPG=IPG+1                                                         00007010
      WRITE(IWM,820)X,Y,TX,S1,S2,SM,D,VS,T,SA                           00007020
  820 FORMAT(' ',10E13,5)                                               00007030
C       EFFECTIVE STACK HEIGHT MUST BE GE 1,                            00007040
  888 IF(SM,LT,1,) SM=1,                                                00007050
C       SEPARATE AREA AND POINT SOURCE DATA                             00007060
      IF(TX,LE,0,) GOTO510                                              00007070
C       STORE AREA SOURCE DATA                                          00007080
C         MOVE COORDINATE TO CENTER OF GRID CELL                        00007090
      DXT=0,5*DY                                                        00007100
      XM=0                                                              00007110
      YM=0                                                              00007120
      AMTX/IXX                                                          00007130
      S=TX*ATX                                                          00007140
      B=S1/S                                                            00007150
      D=S2/S                                                            00007160
C       BECAUSE OF THE METHOD OF INTEGRATION, AREA SOURCES ARE          00007170
C       DIVIDED BY T=0 AT THIS POINT FOR MORE EFFICIENT EXECUTION       00007180
C       OF SUBROUTINE AREA,                                             00007190
      BB=0,5                                                            00007200
      DD=0,5                                                            00007210
      XB=(X-XG)/RAT+1,                                                  00007220
      YB=(Y-YG)/RAT+1,                                                  00007230
      IF(B,GT,1,) GOTO531                                               00007240
      MX                                                                00007250
      MY                                                                00007260
      KM                                                                00007270
      L=M                                                               00007280
      GOTO539                                                           00007290
  531 B=B-0,5                                                           00007300
      K=(X-B)+0,55                                                      00007310
      L=(Y-B)+0,55                                                      00007320
      M=(K-M)-0,45                                                      00007330
      N=(L-M)-0,45                                                      00007340
  539 DO532I=K,M                                                        00007350
      DO532J=L,N                                                        00007360
      Z(I,J,1)=B                                                        00007370
      Z(I,J,2)=D                                                        00007380
  532 Z(I,J,3)=S                                                        00007390
      IF(M,GT,IXX) IXX=M                                                00007400
      IF(N,GT,IYY) IYY=N                                                00007410
      IAS=IAS+1                                                         00007420
      GOTO501                                                           00007430
  900 IPG=70                                                            00007440
      TCA=0,5*TD                                                        00007450
      TDB=IXX+0,5*TD                                                    00007460
      TDC=IYY+0,5*TD                                                    00007470
      IF(NLIST,LE,0) WRITE(IWR,821)IAS,IPS                              00007480
  821 FORMAT('0',I10,' AREA SOURCES,',I10,' POINT SOURCES,')            00007490
      RETURN                                                            00007500
C       STORE POINT SOURCE DATA                                         00007510
  510 IPS=IPS+1                                                         00007520
```

```
      PX(IPS)=(X-XG)/RAT+0,5                                            00007530
      PY(IPS)=(Y-YG)/RAT+0,5                                            00007540
      PS(IPS,1)=S1+2,03                                                 00007550
      PS(IPS,2)=S2+2,03                                                 00007560
      PS(IPS,3)=S1+2,55                                                 00007570
      PS(IPS,4)=S2+2,55                                                 00007580
      PH(IPS)=SM                                                        00007590
      PB(IPS)=SA                                                        00007600
      IF(SA,GT,0,) GOTO501                                              00007610
      DD=0,5                                                            00007620
      T=T+273,16                                                        00007630
      B=(T-TA)/T+9,8*VS*D+0                                             00007640
      IF(B,GT,55,) GOTO606                                              00007650
      XX(IPS)=14,+B+0,025                                               00007660
      GOTO605                                                           00007670
  606 XX(IPS)=14,+B+0,6                                                 00007680
  605 PB(IPS)=1,6*B+0,3333                                              00007690
      D=P(IPS)*PB(IPS)+(3,5+XX(IPS))++0,6667                            00007700
      GOTO501                                                           00007710
      END                                                               00007720
```

PARAMETERS

ORIGIN: (0.0 , 0.0)

WEIGHTING GRID NX= 1 WEIGHTING GRID NY= 1

WEIGHTING GRID GX= 1.00 WEIGHTING GRID P = 1.00

PRINT INPUT WIND ROSES (T) NO WEIGHTING FACTORS (T)

POWER= 2.0

SEARCH ANGLE= 45.0

STATIONS

STATION NO.	X	Y	IDENTIFICATION
1	20.75	10.00	JFK

STABILITY CLASS 1

WINDSPEED CLASS

WIND DIR.	1	2	3	4	5	6	SUM
N	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NNE	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NE	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ENE	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SE	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WNW	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NW	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NNW	0.000210	0.000070	0.0	0.0	0.0	0.0	0.000280
SUM	0.000210	0.000070	0.0	0.0	0.0	0.0	0.000280

TOTAL FREQUENCY OF OCCURRENCE, CLASS 1 = 0.00028

STABILITY CLASS 2

WINDSPEED CLASS

WIND DIR.	1	2	3	4	5	6	SUM
N	0.000160	0.000960	0.000550	0.0	0.0	0.0	0.001670
NNE	0.000230	0.000680	0.000480	0.0	0.0	0.0	0.001390
NE	0.000510	0.000750	0.000410	0.0	0.0	0.0	0.001670
ENE	0.000500	0.000480	0.000340	0.0	0.0	0.0	0.001320
E	0.000580	0.000680	0.000210	0.0	0.0	0.0	0.001470
ESE	0.000080	0.000410	0.000140	0.0	0.0	0.0	0.000630
SE	0.000070	0.000140	0.000340	0.0	0.0	0.0	0.000550
SSE	0.000140	0.000140	0.000480	0.0	0.0	0.0	0.000760
S	0.000240	0.001160	0.002600	0.0	0.0	0.0	0.004000
SSW	0.000070	0.000210	0.001030	0.0	0.0	0.0	0.001310
SW	0.000230	0.000750	0.001030	0.0	0.0	0.0	0.002010
WSW	0.000290	0.000410	0.000750	0.0	0.0	0.0	0.001450
W	0.000230	0.000680	0.000550	0.0	0.0	0.0	0.001460
WNW	0.000150	0.000340	0.000340	0.0	0.0	0.0	0.000830
NW	0.000290	0.000270	0.000680	0.0	0.0	0.0	0.001240
NNW	0.000080	0.000480	0.000340	0.0	0.0	0.0	0.000900
SUM	0.003850	0.008580	0.010270	0.0	0.0	0.0	0.022660

TOTAL FREQUENCY OF OCCURRENCE, CLASS 2 = 0.02266

STABILITY CLASS 3

WINDSPEED CLASS

WIND DIR,	1	2	3	4	5	6	SUM
N	0,000350	[illegible]	[illegible]	[illegible]	0,000070	0,0	0,007200
NNE	0,000070	[illegible]	[illegible]	[illegible]	0,0	0,0	0,004580
NE	0,000280	[illegible]	[illegible]	[illegible]	0,0	0,0	0,003770
ENE	0,000420	[illegible]	[illegible]	[illegible]	0,0	0,0	0,003170
E	0,000420	0,001610	0,001540	0,000140	0,0	0,0	0,003710
ESE	0,000140	[illegible]	[illegible]	0,000140	0,0	0,0	0,001980
SE	0,000210	0,000350	0,001890	0,000140	0,0	0,0	0,003500
SSE	0,000070	[illegible]	[illegible]	0,000280	0,000070	0,0	0,003500
S	0,000280	[illegible]	[illegible]	[illegible]	0,000070	0,0	0,009210
SSW	0,000280	0,000350	[illegible]	[illegible]	0,000420	0,000070	0,028000
SW	0,000280	[illegible]	[illegible]	[illegible]	0,000140	0,0	0,007810
WSW	0,000140	[illegible]	[illegible]	[illegible]	0,000070	0,0	0,008190
W	0,000210	[illegible]	[illegible]	[illegible]	0,0	0,0	0,010570
WNW	0,000210	[illegible]	[illegible]	[illegible]	0,000070	0,0	0,007140
NW	0,0	[illegible]	[illegible]	[illegible]	0,0	0,0	0,002660
NNW	0,000280	[illegible]	[illegible]	[illegible]	0,000210	0,0	0,005040
SUM	0,002590	[illegible]	[illegible]	[illegible]	0,001390	0,000070	0,106580

TOTAL FREQUENCY OF OCCURRENCE, CLASS 3 = [illegible]

STABILITY CLASS 4

WINDSPEED CLASS

WIND DIR,	1	2	3	4	5	6	SUM
N	0,000150	0,001020	[illegible]	[illegible]	0,002010	0,000790	0,026415
NNE	0,000120	0,001560	[illegible]	[illegible]	0,000960	0,000240	0,015665
NE	0,000240	0,002202	[illegible]	[illegible]	0,001265	0,000375	0,016385
ENE	0,000270	0,002295	[illegible]	[illegible]	0,001025	0,000205	0,014100
E	0,000555	0,003630	[illegible]	[illegible]	0,001665	0,000720	0,018540
ESE	0,000465	[illegible]	[illegible]	[illegible]	0,000480	0,000105	0,009510
SE	0,000230	0,002025	[illegible]	[illegible]	0,000445	0,000035	0,010230
SSE	0,000360	0,001350	[illegible]	[illegible]	0,000480	0,000070	0,009400
S	0,000520	0,003555	[illegible]	[illegible]	0,005585	0,000925	0,046825
SSW	0,000365	[illegible]	[illegible]	[illegible]	0,001850	0,000275	0,019515
SW	0,000225	[illegible]	[illegible]	[illegible]	0,000445	0,000135	0,014575
WSW	[illegible]	[illegible]	[illegible]	[illegible]	0,001130	0,000240	0,020020
W	0,000150	0,001200	[illegible]	[illegible]	0,006780	0,002740	0,033840
WNW	0,000005	[illegible]	[illegible]	[illegible]	0,006235	0,001815	0,023295
NW	0,000090	0,000840	[illegible]	[illegible]	0,006800	0,002570	0,035315
NNW	0,000060	0,000615	[illegible]	[illegible]	0,003255	0,000650	0,020280
SUM	0,004150	0,026990	[illegible]	[illegible]	0,045290	0,011890	0,333509

TOTAL FREQUENCY OF OCCURRENCE, CLASS 4 = [illegible]

STABILITY CLASS 5

WINDSPEED CLASS

WIND DIR,	1	2	3	4	5	6	SUM
N	0,000150	0,001025	0,001190	0,000790	0,002010	0,000790	0,026415
NNE	0,000120	[illegible]	[illegible]	[illegible]	0,000960	0,000240	0,015665
NE	0,000240	[illegible]	[illegible]	[illegible]	0,001265	0,000375	0,016385
ENE	0,000270	[illegible]	[illegible]	[illegible]	0,001025	0,000205	0,014100
E	0,000555	[illegible]	[illegible]	[illegible]	0,001665	0,000720	0,018540
ESE	0,000465	[illegible]	[illegible]	[illegible]	0,000480	0,000105	0,009510
SE	0,000230	[illegible]	[illegible]	[illegible]	0,000445	0,000035	0,010230
SSE	0,000360	0,001350	0,000515	0,000280	0,000480	0,000070	0,009400
S	0,000520	0,003555	0,014400	0,021460	0,005585	0,000925	0,046825
SSW	0,000365	0,001665	0,007810	0,017330	0,001850	0,000275	0,019515
SW	0,000225	0,001640	0,006920	0,005205	0,000445	0,000135	0,014575
WSW	0,000295	0,002015	0,009355	0,007965	0,001130	0,000240	0,020020
W	0,000150	0,001200	0,006705	0,015625	0,006780	0,002740	0,033840
WNW	0,000005	0,000540	0,002775	0,012125	0,006835	0,001815	0,023295
NW	0,000090	0,000840	0,003630	0,015590	0,006800	0,002570	0,035315
NNW	0,000060	0,000615	0,002660	0,012260	0,003255	0,000650	0,020280
SUM	0,004150	0,026990	0,099660	0,148135	0,045290	0,011890	0,333509

TOTAL FREQUENCY OF OCCURRENCE, CLASS 5 = 0,33351

STABILITY CLASS 6

WIND DIR,	WINDSPEED CLASS 1	2	3	4	5	6	SUM
N	0,000870	0,005980	0,009800	0,0	0,0	0,0	0,016630
NNE	0,000710	0,005140	0,005890	0,0	0,0	0,0	0,011740
NE	0,001100	0,007530	0,002880	0,0	0,0	0,0	0,011510
ENE	0,002150	0,007680	0,001780	0,0	0,0	0,0	0,011610
E	0,002770	0,007530	0,000750	0,0	0,0	0,0	0,011050
ESE	0,001240	0,003290	0,000680	0,0	0,0	0,0	0,005210
SE	0,000610	0,003360	0,000960	0,0	0,0	0,0	0,004930
SSE	0,000820	0,003010	0,001510	0,0	0,0	0,0	0,005340
S	0,001910	0,010000	0,006850	0,0	0,0	0,0	0,018760
SSW	0,001170	0,007190	0,006920	0,0	0,0	0,0	0,015280
SW	0,001000	0,009730	0,007400	0,0	0,0	0,0	0,018130
WSW	0,001220	0,010480	0,010480	0,0	0,0	0,0	0,022180
W	0,001440	0,007190	0,009380	0,0	0,0	0,0	0,018010
WNW	0,000820	0,003080	0,005750	0,0	0,0	0,0	0,009650
NW	0,000610	0,003150	0,008840	0,0	0,0	0,0	0,012600
NNW	0,000740	0,002670	0,007400	0,0	0,0	0,0	0,010810
SUM	0,019180	0,096990	0,087270	0,0	0,0	0,0	0,203440

TOTAL FREQUENCY OF OCCURRENCE, CLASS 6 = 0,20344

TOTAL FREQUENCY OF OCCURRENCE, CLASSES 1 TO 6 = 0,99998

STATION NO,	X	Y	IDENTIFICATION
2	22,50	17,25	LAGUARDIA

TOTAL FREQUENCY OF OCCURRENCE, CLASS 1 = 0,0

STABILITY CLASS 2

WIND DIR,	WINDSPEED CLASS 1	2	3	4	5	6	SUM
N	0,000870	0,001230	0,000200	0,0	0,0	0,0	0,002300
NNE	0,000230	0,000610	0,0	0,0	0,0	0,0	0,000840
NE	0,000240	0,001230	0,001230	0,0	0,0	0,0	0,002700
ENE	0,000440	0,000820	0,000410	0,0	0,0	0,0	0,001670
E	0,000450	0,001230	0,000200	0,0	0,0	0,0	0,001880
ESE	0,000220	0,000200	0,0	0,0	0,0	0,0	0,000420
SE	0,000010	0,000410	0,0	0,0	0,0	0,0	0,000420
SSE	0,0	0,0	0,000200	0,0	0,0	0,0	0,000200
S	0,000020	0,000610	0,000200	0,0	0,0	0,0	0,000830
SSW	0,000430	0,000200	0,0	0,0	0,0	0,0	0,000630
SW	0,000220	0,000200	0,000410	0,0	0,0	0,0	0,000830
WSW	0,000440	0,000610	0,000200	0,0	0,0	0,0	0,001250
W	0,000230	0,000820	0,000820	0,0	0,0	0,0	0,001870
WNW	0,000240	0,001020	0,000610	0,0	0,0	0,0	0,001870
NW	0,001080	0,001020	0,001020	0,0	0,0	0,0	0,003120
NNW	0,000660	0,001020	0,000820	0,0	0,0	0,0	0,002500
SUM	0,005780	0,011230	0,006120	0,0	0,0	0,0	0,023130

TOTAL FREQUENCY OF OCCURRENCE, CLASS 2 = 0,02313

STABILITY CLASS 3

WINDSPEED CLASS

WIND DIR,	1	2	3	4	5	6	SUM
N	0,000820	0,000610	0,003280	0,000200	0,0	0,0	0,004110
NNE	0,000240	0,000920	0,000600	0,000200	0,0	0,0	0,001960
NE	0,000110	0,000570	0,000530	0,000200	0,0	0,0	0,001310
ENE	0,000040	0,001230	0,000760	0,000410	0,0	0,0	0,002440
E	0,000260	0,001230	0,000820	0,000200	0,0	0,0	0,002510
ESE	0,000260	0,000820	0,000200	0,0	0,0	0,0	0,001280
SE	0,000010	0,000200	0,000410	0,0	0,0	0,0	0,000620
SSE	0,000010	0,000200	0,000820	0,0	0,0	0,0	0,001030
S	0,000480	0,000410	0,003480	0,000610	0,0	0,0	0,004980
SSW	0,000220	0,000200	0,001430	0,0	0,0	0,0	0,001850
SW	0,000480	0,000410	0,004300	0,000410	0,0	0,0	0,005590
WSW	0,000230	0,000410	0,003070	0,000200	0,0	0,0	0,003910
W	0,000250	0,001020	0,003890	0,0	0,0	0,0	0,005160
WNW	0,000050	0,001470	0,003330	0,0	0,0	0,0	0,004850
NW	0,000260	0,001430	0,004510	0,000410	0,0	0,0	0,006610
NNW	0,000050	0,001430	0,002870	0,000200	0,0	0,0	0,004550
SUM	0,002870	0,014920	0,048550	0,003040	0,0	0,0	0,069380

TOTAL FREQUENCY OF OCCURRENCE, CLASS 3 = 0,06938

STABILITY CLASS 4

WINDSPEED CLASS

WIND DIR,	1	2	3	4	5	6	SUM
N	0,000115	0,001125	0,009120	0,012705	0,001435	0,000205	0,024705
NNE	0,000130	0,002255	0,006760	0,007480	0,000410	0,0	0,017035
NE	0,000225	0,001640	0,008195	0,002150	0,000615	0,000205	0,021020
ENE	0,000140	0,003280	0,009225	0,008405	0,002255	0,001535	0,027085
E	0,000450	0,003485	0,008195	0,006610	0,000615	0,0	0,017355
ESE	0,000120	0,001330	0,004200	0,001435	0,000308	0,0	0,007490
SE	0,000120	0,001435	0,005840	0,001640	0,000308	0,0	0,009340
SSE	0,000220	0,001125	0,003995	0,001945	0,000820	0,0	0,008105
S	0,000260	0,003175	0,013420	0,012805	0,001125	0,0	0,030785
SSW	0,000425	0,001125	0,006250	0,005125	0,000410	0,0	0,013335
SW	0,000330	0,001945	0,009530	0,007680	0,000510	0,0	0,020000
WSW	0,000110	0,000820	0,007070	0,009015	0,000820	0,000205	0,018040
W	0,000010	0,001125	0,006045	0,022130	0,004405	0,000410	0,034125
WNW	0,000115	0,001125	0,006865	0,020910	0,006045	0,001125	0,040175
NW	0,000210	0,000305	0,004715	0,019365	0,006865	0,002560	0,034020
NNW	0,000810	0,000715	0,004920	0,015880	0,003585	0,000305	0,026415
SUM	0,002970	0,026010	0,114405	0,163620	0,034005	0,006960	0,348009

TOTAL FREQUENCY OF OCCURRENCE, CLASS 4 = 0,34801

STABILITY CLASS 5

WINDSPEED CLASS

WIND DIR,	1	2	3	4	5	6	SUM
N	0,000115	0,001125	0,009120	0,012705	0,001435	0,000205	0,024705
NNE	0,000130	0,002255	0,006760	0,007480	0,000410	0,0	0,017035
NE	0,000225	0,001640	0,008195	0,008195	0,002150	0,000615	0,021020
ENE	0,000140	0,003280	0,009225	0,008405	0,002255	0,001535	0,027085
E	0,000450	0,003485	0,008195	0,006610	0,000615	0,0	0,017355
ESE	0,000120	0,001330	0,004200	0,001535	0,000308	0,0	0,007490
SE	0,000120	0,001435	0,005840	0,001640	0,000305	0,0	0,009340
SSE	0,000220	0,001125	0,003995	0,001945	0,000820	0,0	0,008105
S	0,000260	0,003175	0,013420	0,012805	0,001125	0,0	0,030785
SSW	0,000425	0,001125	0,006250	0,005125	0,000410	0,0	0,013335
SW	0,000330	0,001945	0,009530	0,007680	0,000510	0,0	0,020000
WSW	0,000110	0,000820	0,007070	0,009015	0,000820	0,000205	0,018040
W	0,000010	0,001125	0,006045	0,022130	0,004405	0,000410	0,034125
WNW	0,000115	0,001125	0,006865	0,020910	0,006045	0,001125	0,040175
NW	0,000210	0,000305	0,004715	0,019365	0,006865	0,002560	0,034020
NNW	0,000810	0,000715	0,004920	0,015880	0,003585	0,000305	0,026415
SUM	0,002970	0,026010	0,114405	0,163620	0,034005	0,006960	0,348009

TOTAL FREQUENCY OF OCCURRENCE, CLASS 5 = 0,34801

STABILITY CLASS 6

WINDSPEED CLASS

WIND DIR,	1	2	3	4	5	6	SUM
N	0,000580	0,007170	0,008610	0,0	0,0	0,0	0,016120
NNE	0,001190	0,007990	0,009820	0,0	0,0	0,0	0,018200
NE	0,000540	0,007790	0,006970	0,0	0,0	0,0	0,015320
ENE	0,000750	0,006540	0,001430	0,0	0,0	0,0	0,008740
E	0,001200	0,008200	0,002600	0,0	0,0	0,0	0,012060
ESE	0,001310	0,002870	0,000820	0,0	0,0	0,0	0,005000
SE	0,000870	0,002050	0,001060	0,0	0,0	0,0	0,004560
SSE	0,000480	0,001480	0,001230	0,0	0,0	0,0	0,003190
S	0,003180	0,012910	0,004300	0,0	0,0	0,0	0,020370
SSW	0,002030	0,007990	0,004300	0,0	0,0	0,0	0,014320
SW	0,000580	0,007790	0,007970	0,0	0,0	0,0	0,016340
WSW	0,002180	0,005130	0,007580	0,0	0,0	0,0	0,014880
W	0,000290	0,004350	0,011070	0,0	0,0	0,0	0,015660
WNW	0,001170	0,006970	0,015980	0,0	0,0	0,0	0,024120
NW	0,000250	0,002460	0,007790	0,0	0,0	0,0	0,010500
NNW	0,000250	0,002250	0,007380	0,0	0,0	0,0	0,009880
SUM	0,016590	0,095900	0,098770	0,0	0,0	0,0	0,211260

TOTAL FREQUENCY OF OCCURRENCE, CLASS 6 = 0,21126

TOTAL FREQUENCY OF OCCURRENCE, CLASSES 1 TO 6 = 0,99979

STATION NO,	X	Y	IDENTIFICATION
3	10,00	12,75	NEWARK

TOTAL FREQUENCY OF OCCURRENCE, CLASS 1 = 0,0

STABILITY CLASS 2

WINDSPEED CLASS

WIND DIR,	1	2	3	4	5	6	SUM
N	0,000180	0,000070	0,000150	0,000200	0,000200	0,000590	0,001370
NNE	0,000260	0,000100	0,000160	0,000290	0,000290	0,000980	0,002100
NE	0,000310	0,000120	0,000170	0,000230	0,000230	0,000890	0,001950
ENE	0,000390	0,000150	0,000230	0,000320	0,000320	0,001030	0,002440
E	0,000470	0,000180	0,000260	0,000340	0,000340	0,000810	0,002400
ESE	0,000390	0,000150	0,000320	0,000490	0,000490	0,001670	0,003510
SE	0,000380	0,000150	0,000200	0,000260	0,000260	0,000990	0,002240
SSE	0,000370	0,000140	0,000290	0,000420	0,000420	0,001570	0,003200
S	0,000370	0,000190	0,000210	0,000290	0,000290	0,000890	0,002200
SSW	0,000510	0,000200	0,000300	0,000410	0,000410	0,001380	0,003210
SW	0,000520	0,000200	0,000300	0,000390	0,000390	0,001470	0,003270
WSW	0,000220	0,000090	0,000240	0,000420	0,000420	0,001530	0,002920
W	0,000430	0,000090	0,000150	0,000220	0,000220	0,001140	0,002050
WNW	0,000220	0,000090	0,000180	0,000290	0,000290	0,001470	0,002540
NW	0,000200	0,000080	0,000140	0,000200	0,000200	0,000980	0,001800
NNW	0,000230	0,000090	0,000160	0,000240	0,000240	0,000940	0,001900
SUM	0,005250	0,002050	0,003450	0,005010	0,005010	0,018330	0,039100

TOTAL FREQUENCY OF OCCURRENCE, CLASS 2 = 0,03910

STABILITY CLASS 3

WIND DIR.	WINDSPEED CLASS 1	2	3	4	5	6	SUM
N	0.000690	0.000260	0.000850	0.000850	0.000910	0.000890	0.003850
NNE	0.000280	0.000570	0.001010	0.001490	0.001850	0.001560	0.006670
NE	0.000170	0.000480	0.000880	0.001200	0.001310	0.001020	0.005060
ENE	0.000120	0.000320	0.000970	0.000830	0.000910	0.000950	0.003700
E	0.000290	0.000370	0.000550	0.000620	0.000650	0.000530	0.003010
ESE	0.000170	0.000370	0.000610	0.001510	0.001800	0.001570	0.006030
SE	0.000120	0.000230	0.000400	0.000980	0.001160	0.001310	0.004200
SSE	0.000260	0.000420	0.000690	0.001690	0.002020	0.002100	0.007180
S	0.000300	0.000400	0.000600	0.000770	0.000820	0.000700	0.003990
SSW	0.000340	0.000660	0.001130	0.001610	0.001770	0.001730	0.007240
SW	0.000550	0.000980	0.001630	0.002310	0.002510	0.002640	0.010620
WSW	0.000190	0.000630	0.001200	0.002330	0.002680	0.003080	0.010050
W	0.000280	0.000350	0.000560	0.001610	0.001930	0.002260	0.006930
WNW	0.000150	0.000390	0.000690	0.002650	0.002460	0.003120	0.008840
NW	0.000100	0.000240	0.000410	0.001420	0.001730	0.002410	0.006330
NNW	0.000040	0.000240	0.000480	0.001380	0.001980	0.001920	0.005980
SUM	0.003330	0.006930	0.011900	0.022870	0.026110	0.027710	0.098850

TOTAL FREQUENCY OF OCCURRENCE, CLASS 3 = 0.09885

STABILITY CLASS 4

WIND DIR.	WINDSPEED CLASS 1	2	3	4	5	6	SUM
N	0.001030	0.002600	0.004410	0.003090	0.000368	0.000335	0.012140
NNE	0.002445	0.007520	0.011845	0.004420	0.000680	0.000690	0.029595
NE	0.002785	0.006115	0.008340	0.004550	0.000540	0.000490	0.022560
ENE	0.001925	0.003525	0.000990	0.003010	0.000490	0.000385	0.014205
E	0.003095	0.003835	0.003265	0.001170	0.000170	0.000150	0.011690
ESE	0.002570	0.004390	0.004330	0.001610	0.000210	0.000205	0.013315
SE	0.001215	0.002670	0.002275	0.000885	0.000085	0.000105	0.006635
SSE	0.001995	0.003975	0.004525	0.001840	0.000175	0.000220	0.012730
S	0.002015	0.003585	0.003560	0.001320	0.000175	0.000165	0.010780
SSW	0.003175	0.006765	0.008975	0.004445	0.000750	0.000595	0.024905
SW	0.003820	0.006620	0.007650	0.003285	0.000415	0.000415	0.022405
WSW	0.002325	0.006715	0.006750	0.003635	0.000605	0.000800	0.020830
W	0.001910	0.003680	0.007320	0.005035	0.000720	0.000550	0.018775
WNW	0.001245	0.003845	0.012705	0.011280	0.001810	0.001135	0.032020
NW	0.000860	0.002735	0.011395	0.011100	0.002135	0.001225	0.029450
NNW	0.000830	0.002775	0.009660	0.008410	0.001215	0.000840	0.023750
SUM	0.032760	0.068870	0.112390	0.071000	0.010360	0.007865	0.303224

TOTAL FREQUENCY OF OCCURRENCE, CLASS 4 = 0.30322

STABILITY CLASS 5

WIND DIR.	WINDSPEED CLASS 1	2	3	4	5	6	SUM
N	0.001080	0.002550	0.004730	0.002890	0.000245	0.000045	0.011460
NNE	0.002605	0.007620	0.011650	0.006170	0.000620	0.000060	0.028125
NE	0.002665	0.006015	0.008170	0.004180	0.000380	0.000080	0.021470
ENE	0.001875	0.003675	0.000900	0.002930	0.000400	0.000095	0.013675
E	0.003025	0.003755	0.003145	0.001085	0.000080	0.000020	0.011110
ESE	0.002530	0.004330	0.004220	0.001510	0.000180	0.000025	0.012715
SE	0.001195	0.002630	0.002225	0.000835	0.000025	0.000005	0.006315
SSE	0.001965	0.003905	0.004405	0.001730	0.000065	0.000010	0.012080
S	0.001985	0.003465	0.003430	0.001210	0.000075	0.000015	0.010180
SSW	0.003068	0.006585	0.008670	0.004408	0.000520	0.000135	0.023385
SW	0.003650	0.006340	0.007190	0.002995	0.000175	0.000035	0.020385
WSW	0.002235	0.006455	0.006480	0.003435	0.000225	0.000030	0.018860
W	0.001450	0.003535	0.007130	0.004855	0.000550	0.000110	0.017685
WNW	0.001205	0.003765	0.012575	0.011090	0.001610	0.000315	0.030560
NW	0.000830	0.002685	0.011295	0.010960	0.001975	0.000455	0.028200
NNW	0.000800	0.002735	0.009610	0.008280	0.001068	0.000280	0.022690
SUM	0.031810	0.067340	0.109830	0.068860	0.007910	0.001635	0.287005

TOTAL FREQUENCY OF OCCURRENCE, CLASS 5 = 0.28700

STABILITY CLASS 6

WINDSPEED CLASS

WIND DIR.	1	2	3	4	5	6	SUM
N	0,001030	0,001540	0,002450	0,002340	0,002300	0,001260	0,010920
NNE	0,001610	0,003100	0,005260	0,004040	0,003650	0,002010	0,019670
NE	0,001840	0,002450	0,003760	0,001780	0,001140	0,000630	0,011600
ENE	0,001250	0,001200	0,001590	0,000670	0,000370	0,000200	0,005280
E	0,001050	0,001560	0,001920	0,000660	0,000260	0,000140	0,006390
ESE	0,001030	0,001200	0,001750	0,000720	0,000395	0,000210	0,005305
SE	0,000720	0,000740	0,001020	0,000480	0,000310	0,000170	0,003440
SSE	0,001250	0,001770	0,002770	0,001450	0,001020	0,000560	0,008820
S	0,001980	0,002550	0,003860	0,001800	0,001130	0,000620	0,011959
SSW	0,003860	0,006400	0,010470	0,005140	0,003420	0,001880	0,031170
SW	0,007090	0,010760	0,017180	0,007380	0,004210	0,002320	0,048940
WSW	0,003580	0,006070	0,010000	0,004900	0,003260	0,001790	0,029600
W	0,002610	0,004350	0,007120	0,004680	0,003900	0,002140	0,024800
WNW	0,001570	0,002930	0,004930	0,004780	0,004730	0,002600	0,021540
NW	0,001130	0,001770	0,002860	0,004130	0,006540	0,004080	0,020510
NNW	0,000900	0,001420	0,002290	0,003420	0,003790	0,002080	0,013900
SUM	0,033310	0,049810	0,079230	0,068370	0,058420	0,031110	0,270250

TOTAL FREQUENCY OF OCCURRENCE, CLASS 6 = 0,27025

TOTAL FREQUENCY OF OCCURRENCE, CLASSES 1 TO 6 = 0,99831

CDM VERSION 75104, RUN 10

THE CENTRAL WIND SPEEDS OF THE SIX WIND SPEED CLASSES (U):
0,150000E 01 0,265872E 01 0,447040E 01 0,692912E 01 0,961130E 01 0,125171E 02

THE EXPONENTIAL OF THE VERTICAL WIND PROFILE BY STABILITY CLASS (UE):
0,100000E 00 0,150000E 00 0,200000E 00 0,250000E 00 0,250000E 00 0,300000E 00

THE INITIAL SIGMA Z FOR AREA SOURCES BY STABILITY CLASS (SZA):
0,300000E 02 0,300000E 02 0,300000E 02 0,300000E 02 0,300000E 02 0,300000E 02

THE CLIMATOLOGICAL MEAN NOCTURNAL AND AFTERNOON MIXING HEIGHTS (MMIN,MT):
0,500000E 03 0,1000000E 04

THE DAY AND NIGHT EMISSION HEIGHT FACTORS (YD,YN):
0,1000000E 01 0,1000000E 01

THE XMIN AND YMIN OF THE AREA EMISSION INVENTORY GRID (XG,YG):
0,0 0,0

THE WIDTH OF A BASIC AREA SOURCE SQUARE (TXX):
0,2000000E 04

THE NUMBER OF SUB-SECTORS CONSIDERED IN A 22,5 DEGREE SECTOR, AND ANGULAR WIDTH OF A SUB-SECTOR (DINT,THETA):
0,4000000E 01 0,5625000E 01

THE INITIAL RADIAL INCREMENT (DELR):
0,2500000E 03

THE RADIAL INCREMENT FACTORS (INC):
1 2 4 6

THE RATIO OF EMISSION GRID TO MAP GRID (RAT):
0,2000000E 01

THE GRID CONVERSION FACTOR (CV):
0,1000000E 04

THE AMBIENT AIR TEMPERATURE (TCA):
0,2931400E 03

THE DECAY RATE HALF LIFE FOR P 1 AND P 2 (GB):
0,3000000E 01 0,3000000E 01

THE SIGMA Z COEFFICIENT TABLE (G):

0,2539000E-03	0,2539000E-03	0,3830000E-01	0,2088600E 01	0,2088600E 01	0,1281200E 01
0,4936000E-01	0,4936000E-01	0,1393000E 00	0,1113700E 01	0,1113700E 01	0,9447000E 00
0,1154000E 00	0,1014000E 00	0,1120000E 00	0,9109000E 00	0,9260000E 00	0,9100000E 00
0,7368000E 00	0,2591000E 00	0,8560000E-01	0,5442000E 00	0,6889000E 00	0,8650000E 00
0,1296000E 01	0,2527000E 00	0,8180000E-01	0,4421000E 00	0,6341000E 00	0,8155000E 00

CDM VERSION 78166, RUN 10

SOURCE INPUT

X	Y	TK	SI	SZ	SH	D	VS	T	SA
0,0	0,22000E 02	0,88000E 04	0,28280E 02	0,0	0,10000E 01	0,0	0,0	0,0	0,0
0,0	0,0	0,88000E 04	0,28280E 02	0,0	0,10000E 01	0,0	0,0	0,0	0,0
0,10000E 02	0,10000E 02	0,88000E 04	0,63000E 02	0,0	0,15000E 02	0,0	0,0	0,0	0,0
0,10000E 02	0,14000E 02	0,88000E 04	0,63000E 02	0,0	0,15000E 02	0,0	0,0	0,0	0,0
0,14000E 02	0,14000E 02	0,28000E 04	0,15940E 03	0,0	0,25000E 02	0,0	0,0	0,0	0,0
0,10000E 02	0,10000E 02	0,88000E 04	0,63000E 02	0,0	0,25000E 02	0,0	0,0	0,0	0,0
0,10000E 02	0,10000E 02	0,88000E 04	0,63000E 02	0,0	0,25000E 02	0,0	0,0	0,0	0,0
0,25000E 02	0,15000E 02	0,0	0,49875E 04	0,0	0,25000E 03	0,50000E 01	0,20000E 02	0,40000E 03	0,0
0,15000E 02	0,25000E 02	0,0	0,99750E 03	0,0	0,10000E 03	0,50000E 01	0,15000E 02	0,40000E 03	0,0
0,15000E 02	0,50000E 01	0,0	0,99750E 03	0,0	0,10000E 03	0,50000E 01	0,15000E 02	0,40000E 03	0,0
0,15000E 02	0,15000E 02	0,0	0,99750E 03	0,0	0,10000E 03	0,50000E 01	0,15000E 02	0,40000E 03	0,0
0,50000E 01	0,15000E 02	0,0	0,19950E 03	0,0	0,50000E 02	0,50000E 01	0,10000E 02	0,40000E 03	0,0

7 AREA SOURCES, 9 POINT SOURCES,

CDM VERSION 78166, RUN 10
(MICROGRAMS PER CUBIC METER)

COORDINATES		AREA		POINT		TOTAL		CALIBRATED		OBSERVED	
		P 1	P 2	P 1	P 2	P 1	P 2	P 1	P 2	P 1	P 2
3,00	3,00	10,	0,	3,	0,	14,	0,	14,	0,	0	0
9,00	3,00	6,	0,	5,	0,	11,	0,	11,	0,	0	0
15,00	3,00	3,	0,	4,	0,	8,	0,	8,	0,	0	0
21,00	3,00	3,	0,	6,	0,	8,	0,	8,	0,	0	0
27,00	3,00	2,	0,	7,	0,	9,	0,	9,	0,	0	0
3,00	9,00	5,	0,	3,	0,	8,	0,	8,	0,	0	0
9,00	9,00	11,	0,	4,	0,	15,	0,	15,	0,	0	0
15,00	9,00	12,	0,	5,	0,	16,	0,	14,	0,	0	0
21,00	9,00	8,	0,	6,	0,	14,	0,	14,	0,	0	0
27,00	9,00	2,	0,	6,	0,	8,	0,	8,	0,	0	0
3,00	15,00	1,	0,	2,	0,	5,	0,	5,	0,	0	0
9,00	15,00	10,	0,	4,	0,	14,	0,	14,	0,	0	0
15,00	15,00	145,	0,	4,	0,	149,	0,	149,	0,	0	0
21,00	15,00	12,	0,	5,	0,	18,	0,	18,	0,	0	0
27,00	15,00	4,	0,	5,	0,	9,	0,	9,	0,	0	0
3,00	21,00	4,	0,	2,	0,	7,	0,	7,	0,	0	0
9,00	21,00	4,	0,	3,	0,	8,	0,	8,	0,	0	0
15,00	21,00	12,	0,	4,	0,	16,	0,	16,	0,	0	0
21,00	21,00	9,	0,	5,	0,	13,	0,	13,	0,	0	0
27,00	21,00	3,	0,	5,	0,	8,	0,	8,	0,	0	0
3,00	27,00	9,	0,	2,	0,	11,	0,	11,	0,	0	0
9,00	27,00	5,	0,	2,	0,	7,	0,	7,	0,	0	0
15,00	27,00	4,	0,	3,	0,	7,	0,	7,	0,	0	0
21,00	27,00	3,	0,	3,	0,	7,	0,	7,	0,	0	0
27,00	27,00	2,	0,	6,	0,	9,	0,	9,	0,	0	0

END OF PROGRAM,